Vol. 178 No. 6 AMERICAN JUNE, 1953

Gas Journal

ROCKWELL *Power Pilot Loaded* "014" REGULATORS

INCREASE THE
OUTLET PRESSURE RANGE
OF WEIGHT LOADED
LOW PRESSURE REGULATORS
GAIN SAFETY

You can get up to 10 psi outlet pressure from a Rockwell "014" regulator with *power pilot* loading. This compares to the 3 psi normally considered maximum for a weight loaded low pressure regulator. Further, you can gain this increased outlet pressure range while still using the basic, time tested Rockwell unit having the advantages of a sensitive long lever design and the balanced valve principle. You can even purchase conversion kits to change over your existing Rockwell "014" regulators to pilot control.

Remember this safety feature . . . should the *power pilot* regulator fail the valves are forced into a closed position. And the entire control mechanism is enclosed to discourage tampering. Write for bulletin 1082.

You Can RELY ON ROCKWELL

ROCKWELL MANUFACTURING COMPANY

PITTSBURGH 8, PA. Atlanta Boston Chicago Houston Kansas City
Los Angeles New York Pittsburgh San Francisco Seattle Tulsa

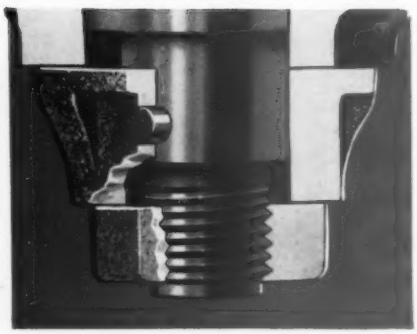
MUELLER®

LubOseal® Gas Meter Stops

(Pat. app'd for)

PLAIN HEAD AND LOCK WING IN STOCK IN SIZES ¾" THROUGH 2".

are really Tamperproof!



LubOseal Gas Meter Stops are so constructed that gas leakage cannot be caused by the customer!

- Key locked in place by pin through large diameter on key and blind hole in washer!
- Key will turn without shearing pin if torque is misapplied to washer!
- Stop will operate satisfactorily and safely even though nut is removed!
- Tightening nut will strip threads without shearing pin and result only in higher turning torque!
- Socket head pipe plug used in grease port requires an uncommon tool, which discourages tampering with grease system!
- "O" Ring Seals positively prevent leakage to atmosphere through top or bottom of stop!
- Plus all the LubOseal long-life features!
- Catalog Nos. H-11170 Plain Head and H-11175 Lock Wing—black or galvanized.

Write Dept. 36 for complete details and samples.

MUELLER CO.

Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

B 431459

TESTING...always TESTING...

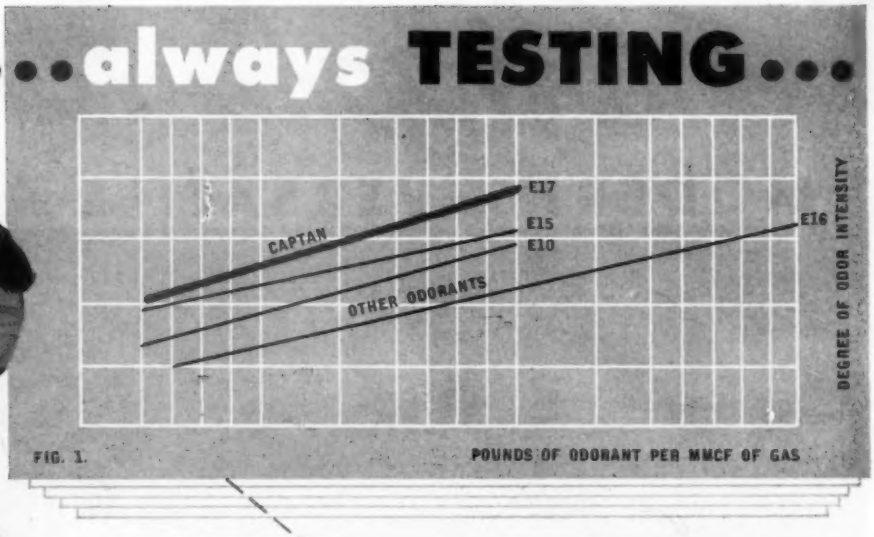
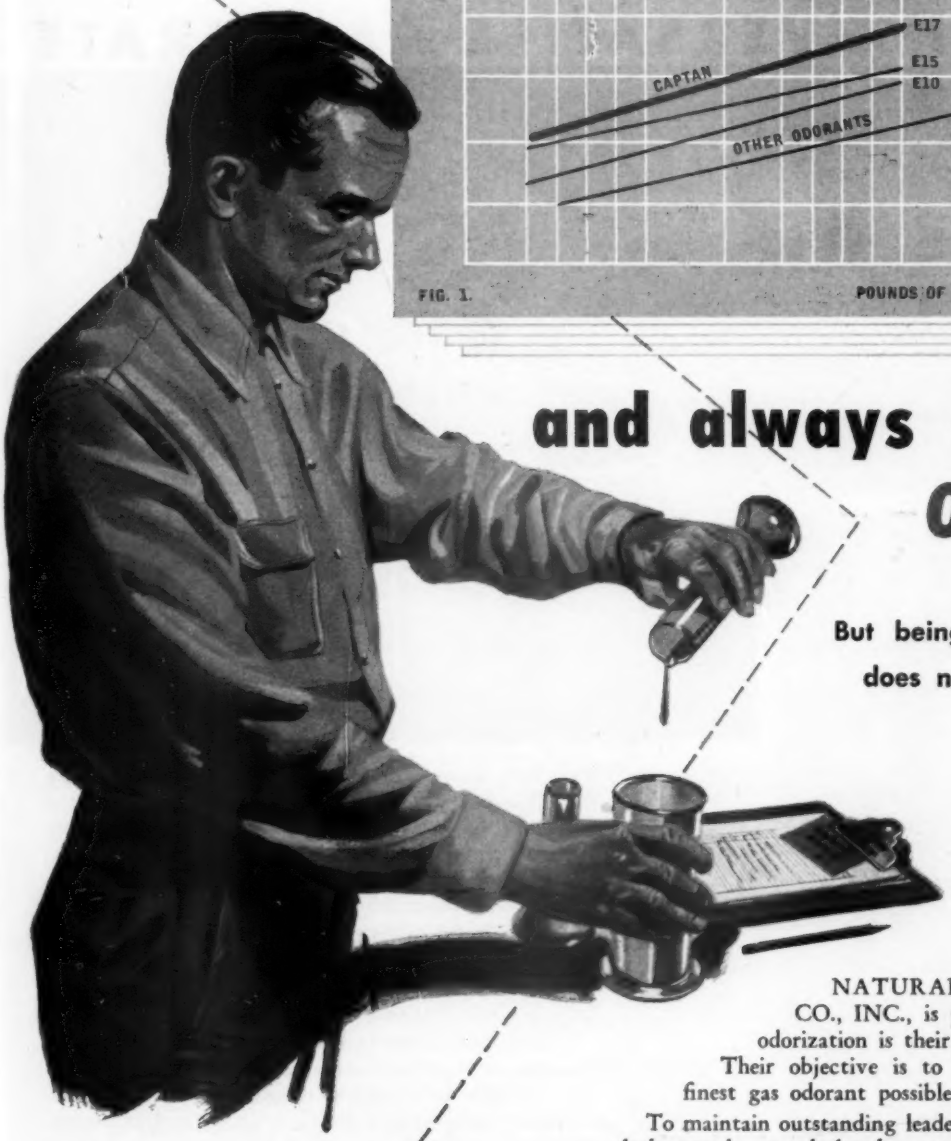


FIG. 1.



and always CAPTAN ON TOP!

But being best right now does not satisfy us . . .

NATURAL GAS ODORIZING CO., INC., is proud of the fact that odorization is their *one* and *only* business. Their objective is to continue to make the finest gas odorant possible.

To maintain outstanding leadership, CAPTAN is regularly tested, not only by the company's own, well-trained chemists, but also by independent laboratories which make comparative tests of all natural gas odorants.

Results of these practical tests definitely prove *CAPTAN best.* CAPTAN has established itself as the leader in this field and intends, through scientific research, to not only continue to be leader, but to widen the gap of its superiority over all others.

DON'T DELAY . . .
phone, wire or write us today.

Prompt Service from our . . .

- EXPERT SPECIALLY TRAINED ENGINEERS
- COMPETENT OFFICE FORCE
- STRATEGICALLY LOCATED WAREHOUSES
- RELIABLE SHIPPING SERVICE

captan

NATURAL GAS ODORIZING CO., INC.

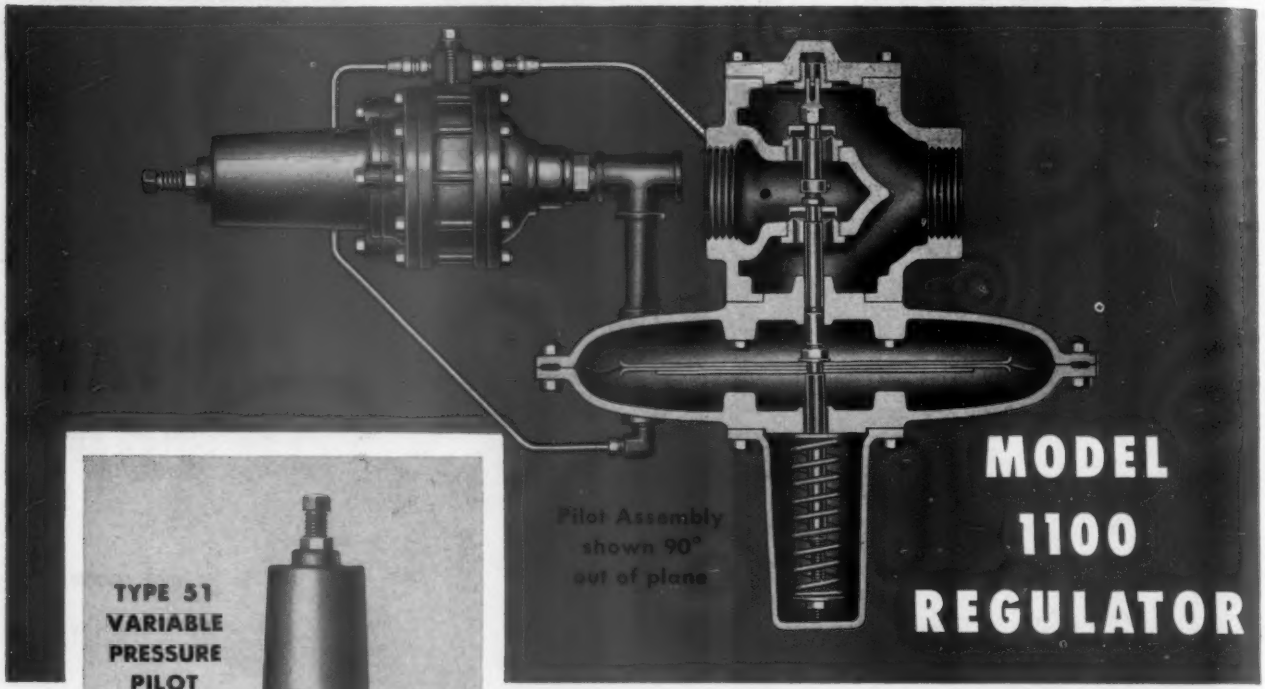
4263

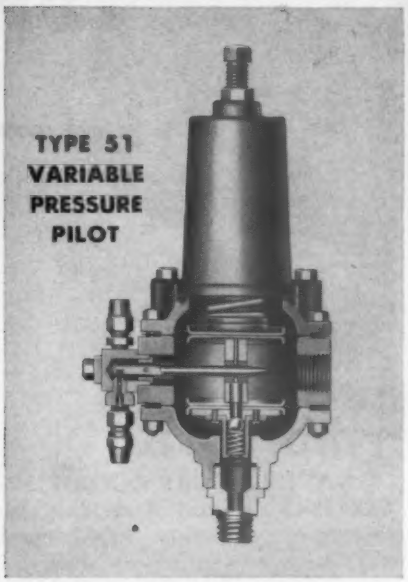
P. O. BOX 1645 HOUSTON, TEXAS

AMERICAN GAS JOURNAL, June, 1953. Vol. 178, No. 6. Published monthly (except October, then semi-monthly), by American Gas Journal Inc., at 73 Main Street, Brattleboro, Vt. Entered as second class matter January 24, 1950, at the post office at Brattleboro, Vt. under Act of March 3, 1879. Executive and editorial offices at 205 East 42nd St., New York 17, New York. Subscription prices, U.S. $3 per year; Canada $4; Foreign $10. Single copies 35 cents, except October 15 issue, which is not sold separately. Printed in U.S.A.

Chaplin-Fulton

MODERN—VERSATILE—ACCURATE





• the heart of the MODEL 1100 assembly, insuring precisely accurate control over the complete flow range. • Unitized construction—valve lever and orifice as a unit are removed from the outside, without disturbing balance of assembly. The likely trouble spot—the orifice—is placed outside where you can get at it quickly—no internal tubes to clog. • Twin diaphragms remove as a unit. • Internal relief unit—guards against overpressure. • Spring unit—remove three screws to change springs. • Built for service. • Used for accuracy.

You can't buy, beg, borrow or steal a more versatile pressure regulator than MODEL 1100. Nor has traditional Chaplin-Fulton ruggedness, simplicity or accuracy been forgotten in this new modern design. Size—2" only.

Wider Application —Inlet Max.—250 psi. Outlet Range—1" to 75 psi or 50 to 150 psi.

Greater Capacity —24,000 CFH at 10 psi to ounces; 114,000 at 100 psi. Body contoured for flow.

Easier Maintenance—regulator or pilot can be serviced without disturbing the other. Quickly accessible orifices in both, easily renewable.

Simpler Installation—only one connection required. No complicated pins or toggles to adjust.

You can standardize on MODEL 1100 for a wider range of your industrial, commercial or distribution installations.

ACCURATE CP MFG CO DEPENDABLE

Chaplin-Fulton
MANUFACTURING COMPANY
Pittsburgh 25, Pennsylvania

AMERICAN Gas Journal
ESTABLISHED 1859

VOLUME 178 JUNE 1953 NUMBER 6

This month...

As editors, we usually follow a policy of appropriate succinctness. Accordingly, we note, with some satisfaction, that Thomas C. Buchanan, lately of the Federal Power Commission, has returned "to the general practice of law" in Beaver, Pa.

. . .

Utility service policies have been the subject of our editorial comment, from time-to-time. As proponents of definite policies that have due regard for the long-term interest of the gas industry, we are pleased to record that some action has been taken. A summary of the American Gas Association survey on the subject starts on page 16. The statistical information certainly merits the attention of all gas company executives for its value in reviewing individual company policies. We would be remiss, indeed, if we did not give the AGA committee on customer service responsibility a well-earned kudo for the work already done. But, that does not seal this important issue in individual company operations.

. . .

Competition, the heart of all progressive industry, can not be viewed lightly by the gas industry and accordingly we feel there will be high interest in the truly objective presentation of the competitive fuels in *American Gas Fundamentals*, starting on page 23. Professor Oscar F. Spencer, the author, has prepared two chapters on the subject; the second will appear in July. Careful study of Professor Spencer's presentation on relative efficiencies will provide *Fundamentals*' students with interesting conclusions.

. . .

And, while talking about competition, the gas appliance manufacturers appear to have gone into action, based upon our observations at their annual meeting in White Sulphur Springs, West Virginia, in late-May. A summary of viewpoints and attitudes expressed at that meeting is on page 43. Also, the Editorial Conference, summarized on page 40, indicates a realistic approach to editors of consumer publications.

Contents

Editorial: The Pennsylvania Coal Grab 13

New Unit Stabilizes Heating Value of Mixed Utility Gas—Robert A. Schoger 14

Gas Utility Service Policies Summarized in AGA Survey .. 16

Southern Gas Association's 45th Meeting Has Record Attendance and Well-Rounded Program 18

Attention to the Dealer's Role Dominates Sales Conferences 20

Concentric Catalytic Generator Design Improved—Virgil Stark 21

Federal Power Commission 22

American Gas Fundamentals: The Competitive Fuels—Part 1—Oscar F. Spencer 23

Bond Market Still in Doldrums—John F. Falvey 27

News of the Gas Industry 28

Men at Work 36

Gas Industry Calendar 38

AMERICAN GAS MERCHANDISING..... 39

Conference Plugs Gas Ranges to Editors With 55½-Million Consumer Circulation 40

Gas Industry Program Gets Priority at GAMA Meeting .. 43

Gas Appliance Industry News 45

Men at Work 45

New Gas Appliances 47

Industry Launches Sales and Public Service Development Program 48

Index to Advertisers 48

Elliott Taylor · Editor

Hilding H. Carlson · Managing Editor

Bernard W. Morris · News Editor

Charles R. Bellamy · Technical Editor

Arthur Rohman · Western Editor **John F. Falvey · Financial Editor**

AMERICAN GAS JOURNAL, established 1859, is published monthly except October, semi-monthly, by American Gas Journal, Inc., 205 East 42 St., New York 17, N. Y. ROBERT M. POE, President and Treasurer; ELLIOTT TAYLOR, Vice-President and Publisher; M. E. KELLEHER, Secretary and Assistant Treasurer.

ADVERTISING REPRESENTATIVES: John P. McDermott, Edwin J. Volckmann, 205 E. 42 St., New York 17, MU 6-4360; Urben Farley & Co., 120 S. LaSalle St., Chicago 3, FI 6-3074; Jack O. Hodges, 479 S. Holt Ave., Los Angeles 48, BR 2-3935; Geo. F. Haines, 681 Market St., San Francisco 5, DO 2-4475.

Member Audit Bureau of Circulations and National Business Publications.

Copyright, 1953, American Gas Journal, Inc., New York, N. Y.

Subscription Rates: U.S. $3.00 per year; Canada, $4.00; Foreign, $10.00. Single copies, 50 cents.
October 15 Handbook issue not sold separately.

When you think of...

PEAK SHAVING

for natural gas,
it's natural to think of

SEMET-SOLVAY

FIRST...

Here's why...

Pioneer in the development of regenerative and non-regenerative oil gas equipment and their adaptation for the conversion of carbureted water gas machines, Semet-Solvay Engineering Division offers you a choice of machines to function as base-load, peak shaving or stand-by equipment. These are the same types of oil gas machines that are currently setting new standards for operational economy, efficiency, and dependability at installations throughout the country.

It is natural to think of Semet-Solvay when you want oil gas equipment that—

- *is fast on the start-up*
- *can be handled with minimum manpower*
- *is capable of high thermal production for prolonged periods of operation.*

Semet-Solvay oil gas processes utilize either light or heavy grades of oil depending on their design. You're sure of satisfactory operation and a uniformly satisfactory product. Yes, as peak shaving becomes more of a necessity because of increasing commodity rates and mounting demand costs, more utility men are looking to Semet-Solvay. So when you think of peak shaving . . . when you think of high Btu oil gas processes for your natural gas operation...
it's natural to think of Semet-Solvay *first.*

SIMPLIFIED IN OPERATION

•

NO SOLID FUEL TO HANDLE

•

NO ASHES TO REMOVE

•

NO CARBON TO BURN OFF

SEMET-SOLVAY ENGINEERING DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector St., New York 6, N. Y.

Allied Chemical

NOW IS THE TIME TO BACK SERVEL

SERVEL MEANS GAS TO THE MILLIONS BEING REACHED BY $6,000,000 AD DRIVE!

Only **SERVEL** *Makes Ice Cubes Without Trays!*

...and puts 'em in a basket- *AUTOMATICALLY*

Look at These Plus Features

- **Huge Freezer Compartment**
- **Automatic Defrost**
- **Roomy Door Shelves**
- **Butter Keeper**
- **Trip-Saver Door Handle**

Utilities across the nation are gratified by the overwhelming response to the Automatic Ice-Maker Refrigerator! And Servel's $6,000,000.00 ad drive has just begun to roll! Scores of magazine ads, newspaper ads in over a 100 key cities, thousands of radio-TV spots and billboards, coast-to-coast will be reaching into every city and town in the nation during the next few months. Now, more than ever this is important to you. The Automatic Ice-Maker Refrigerator provides your best opportunity to take up the slack in the summer gas load! Get aboard the Servel bandwagon... call your Servel Distributor today!

Servel

The name to watch for great advances in REFRIGERATION and AIR CONDITIONING

Servel Inc., Evansville 20, Indiana
In Canada, Servel (Canada) Ltd., 548 King St. W., Toronto, Ontario

How the best product in its field has been made still better

Not overnight, of course—but by a series of improvements gained through research and development resulting in *modernized* cast iron pipe. Tougher, stronger pipe with standardized mechanical joints that are bottle-tight for all working pressures and all types of gas.

All of our member companies have centrifugal casting facilities for producing tougher, stronger *modernized* cast iron pipe. All manufacture the standardized mechanical joint with interchangeable parts—a simple, fool-proof, time-saving joint as the gas industry well knows.

If you want the most efficient and economical pipe ever made for gas distribution, your new mains will be laid with cast iron pipe—centrifugally cast and with standardized mechanical joints. Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3.

CAST Q IRON

The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Modernized **cast iron**

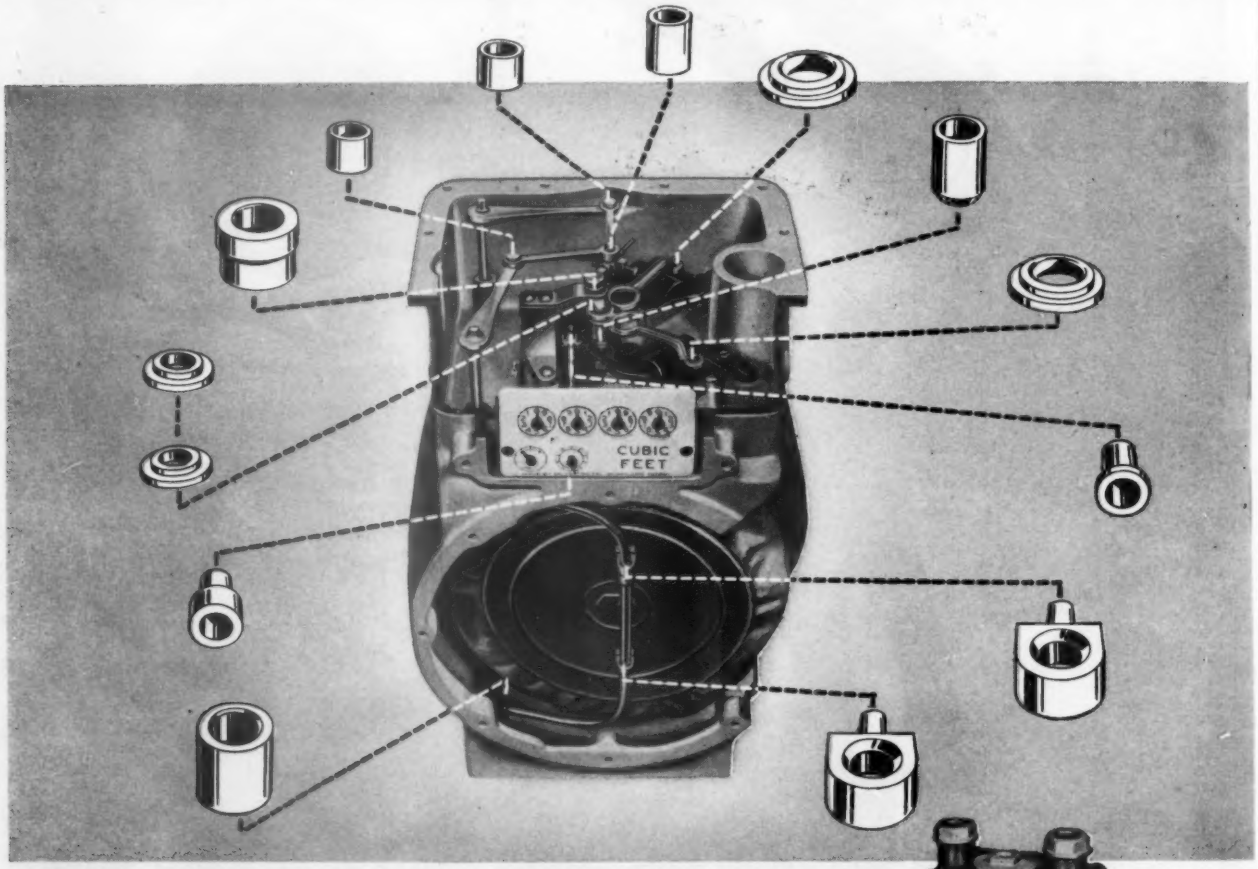
This cast iron gas main, uncovered for inspection, is in fine condition after 119 years' service in Baltimore, Md.—one of more than 40 cities with century-old water or gas mains in service.

pipe for Modern Gas Distribution

TO INCREASE METER LIFE...

TO REDUCE MAINTENANCE...

Self-lubricating Porous Bronze Bearings in AMERICAN® Ironcase and Tinned Steelcase Meters

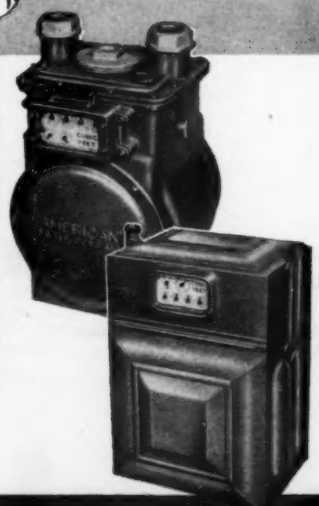


Friction and bearing wear are minimized — bearing lubrication problems are solved by use of self-lubricating porous bearings at critical points in *American* Ironcase and Tinned Steelcase Meters. In addition, exact positioning of bearings for precise alignment with moving parts is automatic through special machines and methods developed by *American*. This results in prolonged service life, greater meter accuracy, elimination of "binds," less need for service, and cost-saving interchangeability of parts in routine meter maintenance.

The American Meter Company produces its own self-lubricating porous bronze bearings. These sintered, oil-impregnated bearings are made with the dependability and know-how characteristic of *American* equipment to provide the finest precision instruments known to gas measurement science.

You will get a better proof record over the extended life of *American* Ironcase and Tinned Steelcase Meters — a better service record of simplified, low-cost maintenance — as a result of *American* pioneering in self-lubricating bearings... another example of *American* advanced engineering for "Sustained Accuracy at Lower Cost."

Write for full details

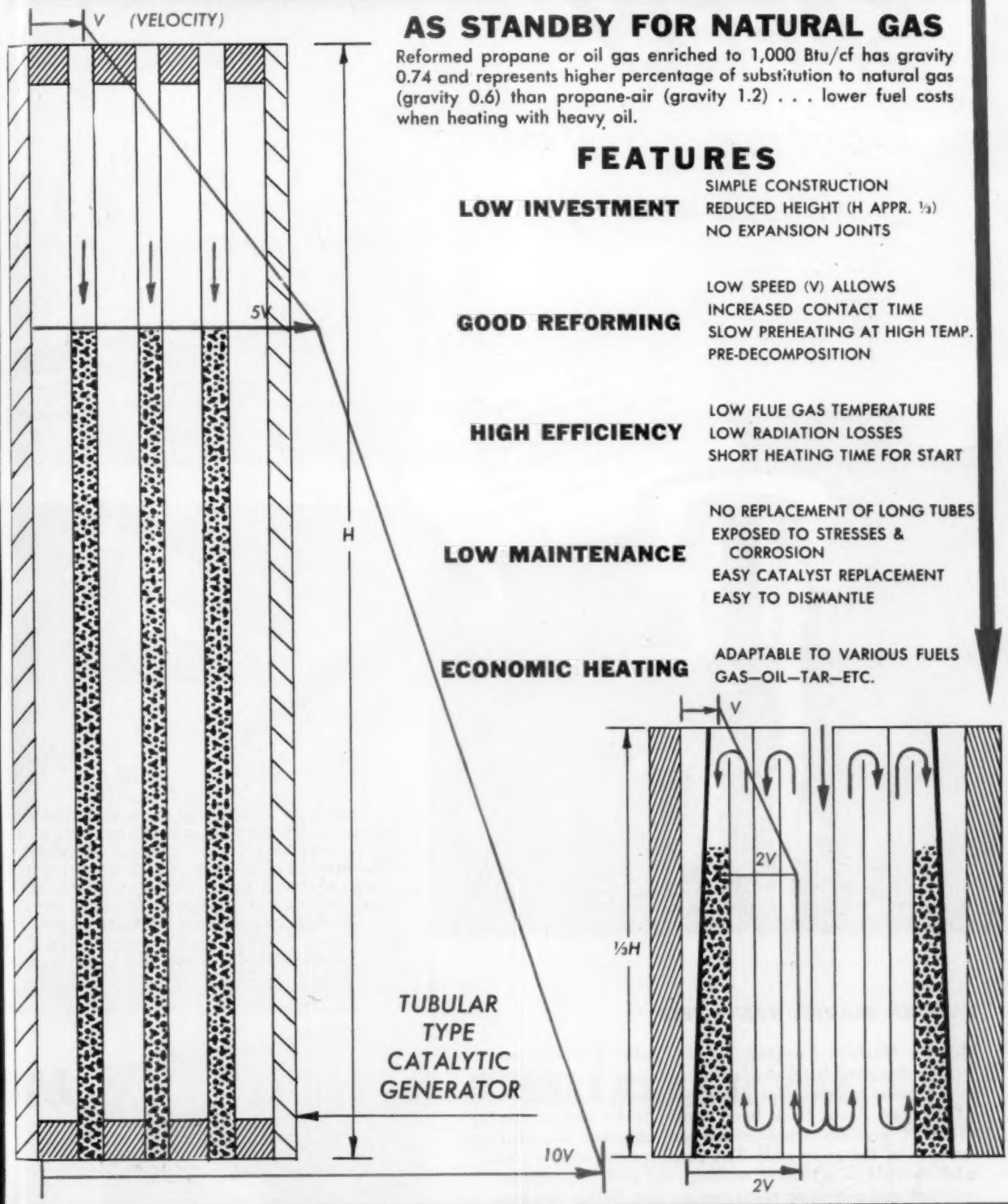


AMERICAN METER COMPANY

AMERICAN METER CO EST. 1836 MEASUREMENT ENGINEERS

GENERAL SALES OFFICE: 1513 Race Street, Philadelphia
Albany • Alhambra • Atlanta • Baltimore • Birmingham
Boston • Chicago • Dallas • Denver • Erie • Houston
Kansas City • Los Angeles • Minneapolis • New York
Omaha • Pittsburgh • San Francisco • Seattle • Tulsa
IN CANADA: Canadian Meter Company, Limited
Hamilton, Ontario • Edmonton, Alberta

CONCENTRIC CATALYTIC GENERATOR



AS STANDBY FOR NATURAL GAS

Reformed propane or oil gas enriched to 1,000 Btu/cf has gravity 0.74 and represents higher percentage of substitution to natural gas (gravity 0.6) than propane-air (gravity 1.2) . . . lower fuel costs when heating with heavy oil.

FEATURES

LOW INVESTMENT
- SIMPLE CONSTRUCTION
- REDUCED HEIGHT (H APPR. ⅓)
- NO EXPANSION JOINTS

GOOD REFORMING
- LOW SPEED (V) ALLOWS INCREASED CONTACT TIME
- SLOW PREHEATING AT HIGH TEMP.
- PRE-DECOMPOSITION

HIGH EFFICIENCY
- LOW FLUE GAS TEMPERATURE
- LOW RADIATION LOSSES
- SHORT HEATING TIME FOR START

LOW MAINTENANCE
- NO REPLACEMENT OF LONG TUBES EXPOSED TO STRESSES & CORROSION
- EASY CATALYST REPLACEMENT
- EASY TO DISMANTLE

ECONOMIC HEATING
- ADAPTABLE TO VARIOUS FUELS GAS—OIL—TAR—ETC.

NORTH AMERICAN UTILITY & CONSTRUCTION CORP.

CHRYSLER BUILDING NEW YORK 17, N. Y.

CONNECT SERVICE LINES

SAFELY

in cast iron or steel mains, without welding

Here's the simple step-by-step procedure for installing Mueller Machine Inserted Service Valve Tees under pressure in either cast iron or steel mains.

STEP 1
SECURE BODY OF MUELLER B MACHINE TO MAIN

CLEAN SURFACE OF MAIN AND POSITION SADDLE AND GASKETS. PLACE MACHINE BODY ON SADDLE AND SECURE TO MAIN WITH CHAIN PROVIDED.

STEP 4 TIGHTEN TEE

CAREFULLY BRUSH ALL CHIPS AWAY FROM BASE OF TEE, ALIGN, AND TIGHTEN TEE BY HAND. TIGHTEN BRONZE COMPRESSION NUT WITH A WRENCH. (NOTE: BRONZE NUT COMPRESSES RUBBER SEALING RING AND FORCES IT TIGHTLY AGAINST MAIN AND PLAIN PORTION OF TEE INLET—RESULTING IN A PERMANENT COMPRESSION SEAL.)

MUELLER SERVICE VALVE TEES

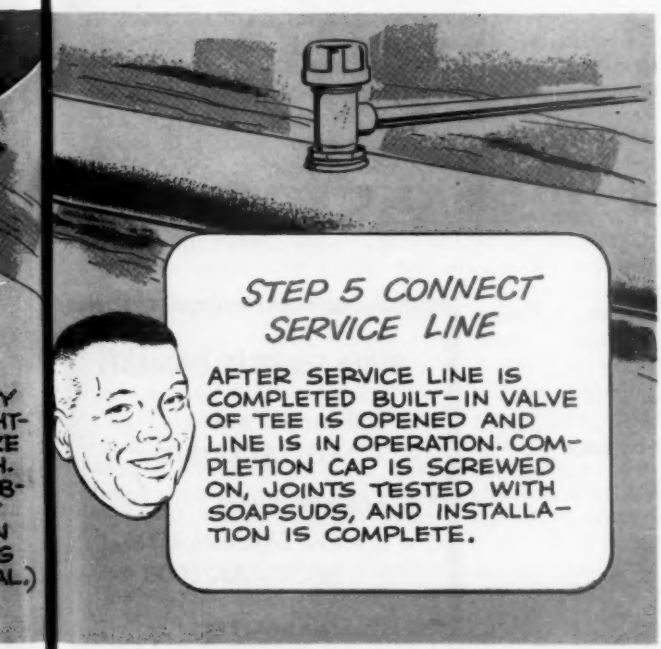
Mueller Machine-Inserted Service Valve Tees are expressly designed for installation under pressure in cast iron pipe or in steel pipe when welding is inadvisable. I.P. thread inlets have been found to be one of the strongest possible connections and develop the full strength of the pipe wall. The compression seal at the inlet consists of a rubber sealing ring within a copper retainer and a bronze compression nut. When the nut is tightened, the copper ring assumes the shape of the pipe and the rubber is highly compressed between the pipe and the plain machined portion of the inlet. This results in a highly effective and permanent seal. The built-in valve provides a simple and positive means of shut-off at any time and, with the completion cap, provides a double seal at the top of the tee when in the open position. Outlets are provided with welding or inside I.P. thread connections.

STEP 2 DRILL AND TAP MAIN

FASTEN COMBINED DRILL AND TAP TO BORING BAR. ATTACH CAP AND BORING BAR ASSEMBLY TO BODY OF MACHINE. DRILL AND TAP MAIN, RETRACT BORING BAR, AND CLOSE BUILT-IN FLOP VALVE. REMOVE CAP AND BORING BAR ASSEMBLY.

STEP 3 SCREW TEE INTO MAIN

REPLACE COMBINATION DRILL AND TAP WITH E-Z RELEASE SCREW PLUG. CLOSE BUILT-IN VALVE OF TEE, FULLY RETRACT BRONZE COMPRESSION NUT, AND ATTACH TEE TO SCREW PLUG. REMOUNT CAP AND BORING BAR ASSEMBLY, OPEN FLOP VALVE, AND SCREW TEE INTO MAIN FIRMLY. RELEASE SCREW PLUG AND REMOVE ENTIRE MACHINE.

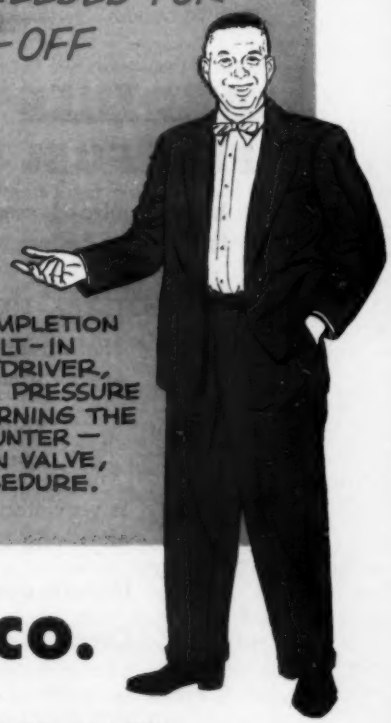


STEP 5 CONNECT SERVICE LINE

AFTER SERVICE LINE IS COMPLETED BUILT-IN VALVE OF TEE IS OPENED AND LINE IS IN OPERATION. COMPLETION CAP IS SCREWED ON, JOINTS TESTED WITH SOAPSUDS, AND INSTALLATION IS COMPLETE.

NO MACHINE NEEDED FOR FUTURE SHUT-OFF

SIMPLY REMOVE COMPLETION CAP AND CLOSE BUILT-IN VALVE WITH SCREWDRIVER, PUTTING ADDITIONAL PRESSURE ON THE STEM BY TURNING THE BRASS BUSHING COUNTER—CLOCKWISE. TO OPEN VALVE, REVERSE THIS PROCEDURE.



LER NO-BLO Method

is is another of a series of gas distribution problems and their step-step solution by Frank Miller, Gas Service Engineer of Mueller Co.

MUELLER CO.

Dependable Since 1857

MAIN OFFICE & FACTORY DECATUR, ILLINOIS

WARNS AT THE FIRST SIGN OF DANGER!

Spotleak 1009

ANOTHER NEW SHARPLES ODORANT FOR FUEL GASES

Like a railroad crossing signal, SPOTLEAK 1009 warns at the first sign of danger.

SPOTLEAK 1009

- The universal odorant, can be used in either by-pass evaporation or liquid injection odorizers.

  Your supply problems are simplified—you need only one odorant.

- Is very stable—resists fading—remains active after long contact time in slow moving gas.
- Uniform composition means uniform odor at all times.
- Corrosion of equipment is minimized.

OTHER SHARPLES ODORANTS

Universal Type:
PENTALARM 86

Injection Type:
PENTALARM 1004
SPOTLEAK 1008

SHARPLES TRADE MARK CHEMICALS

Write for Data Sheet A-53, "Laboratory Determination of Mercaptans in Fuel Gases"

SHARPLES CHEMICALS INC.

A SUBSIDIARY OF THE PENNSYLVANIA SALT MANUFACTURING COMPANY

500 Fifth Ave., New York • 80 E. Jackson Blvd., Chicago • 106 S. Main St., Akron
Martin, Hoyt & Milne Inc., San Francisco • Los Angeles • Seattle • Portland
Shawinigan Chemicals, Ltd., Montreal • Toronto
Airco Company International, New York

Editorial:

The Pennsylvania Coal Grab

THE coal industry of Pennsylvania is right now on the verge of having enacted into law a bill that may, for all practical purposes, stop all further expansion of natural gas house heating in the most populous areas of the state, curtail or eliminate the use of natural gas in vital manufacturing processes and drive gas consuming industries from the state.

This bald and barefaced attempt of the coal interests to achieve by legislative stealth what they have been unable to do in free and open competition—namely halt the advance of natural gas in their state—sails under the banner of Robert Kent, assemblyman from Crawford county. His measure is known as House Bill 1240.

Masked behind the false issue of mine safety—a laudable goal which its provisions will in no way enhance—the bill is so drawn that the coal operators may, at will, either curtail or eliminate the underground storage of natural gas in any area of the state where coal mining operations are now in progress, or in any area where at some future date coal mining may be started.

It implies the incredible hypothesis that the right of the citizens of the commonwealth to buy and use natural gas is secondary to the right of the mine owners to dig for coal.

It sets the stage for the most ruthless persecution of the gas industry by almost any coal company or combination of companies that may now or in the future elect to take advantage of its one-sided provisions. Under the proposed law any coal operator could legally set up the flimsiest token of a mining operation over a gas storage area and by so doing automatically eliminate or curtail the effective storage capacity of that area for all time.

Briefly the provisions of the Kent bill are: Where a gas storage area exists within 2,000 feet of an operating coal mine, or where an operating coal mine comes within that distance of a gas storage reservoir, the further use of that reservoir for storage purposes must be certified by the state Department of Mines as having met certain standards.

The standards to be met fall into two classifications. The first is a set of rules related to the locating and plugging of abandoned gas wells; and with this the gas industry has no quarrel. As a matter of fact, gas companies preparing underground storage pools for repressuring with gas are most meticulous in locating and plugging abandoned wells, entirely on their own initiative. One of the first requirements in an underground reservoir is that it must be absolutely gas tight, if for no other reason than to prevent the loss of the valuable natural gas to be stored.

The second set of provisions have to do with pressure limitations, limiting repressuring to 90% of the hydrostatic pressure from the storage stratum to the lowest workings of the coal mine. In lay terms, this simply means that gas storage reservoirs that once held gas for millions of years at their original rock pressure, can now by these pressure limitation proscriptions be reduced by as much as 50% of their ultimate storage capacity. Cutting the capacity of a storage pool in half could conceivably render its further operation economically unfeasible, and would inevitably increase the cost to the public of gas withdrawn.

If passed, the proposed Pennsylvania legislation may, and in all probability will, become a model after which the coal interests in West Virginia, Ohio and Kentucky will pattern similar proposals to their several legislatures.

The magnitude of such restrictions spreading from state to state can best be understood when we consider that there is already more gas stored underground in Pennsylvania than in any other state in the Union; 157 billion cubic feet, as of December 1952. The combined storage in Pennsylvania, Ohio and West Virginia exceeds 400 billion cubic feet, over 60% of the national total.

Pennsylvania industries are among the country's largest users of natural gas. Many of the industrial heat-treating operations are of such a nature that gas is indispensable to continued production. The state's own natural gas supply has been dwindling for decades, with the vanishing point almost in sight. Without large volume storage, which can only be accomplished by using the underground reservoirs built by nature, long distance transmission lines cannot supply the volumes of gas required for domestic use in wintertime, and at the same time take care of their essential industrial users.

And, during the war years, workers in many Pennsylvania communities discovered to their dismay that when there was no gas there were no jobs. Over 45% of the natural gas sold by utilities in the state is used by industry. It is this industrial load that enables the pipelines to operate at full capacity, winter and summer, and by operating at capacity, keep the cost of natural gas low.

Coal propagandists, appearing before the Pennsylvania House Committee on Mines and Mining, made much over the undeniable tragedy of mine accidents; although no witness was able to authenticate a single instance in which a mine explosion had been in any way related to underground storage of gas.

But all have studiously avoided the question of the increased cost of gas to the citizen if economical underground storage is hampered or eliminated. All avoided mention of the fact that, without adequate storage, Pennsylvania industries will again run short of fuel during the winter months, just as they have in times past. Nobody expressed concern over the plight of the thousands of homeowners now waiting for natural gas heating who may never be able to get it for heating if storage is curtailed.

Unquestionably, the citizens of Pennsylvania have a big stake in their state's wealth of coal reserves. They have an understandable concern over the hazards of coal mining. But they also have an interest in the continued operation of the gas consuming industries that provide them with payroll and jobs. And, like the citizens everywhere, they have an interest in their own health, welfare and comfort, all of which are enhanced by the use of natural gas.

Some might even ask their legislators the simple question: If a coal mine employing five men interferes with a gas storage pool serving thousands of homes and industries, why not compel mining operations to stop 2,000 feet from the gas reservoir?

The issue before the legislature in the form of the Kent bill is not one of safety of miners, as alleged. It is rather a question of whether the citizens of the state are to be denied the fuel they want at prices they can afford to pay, merely to satisfy the selfish interests of a noisy minority who have long since priced the coal they sell out of the competitive market.

Elliott Taylor

New Unit Stabilizes Heating Value of Mixed Utility Gas

Electronic Controller Regulates Gas Processing

by Robert A. Schoger
Senior Engineer
Gas Engineering Plant
Iowa Public Service Co.

THE importance of keeping the heating value of a gas within close limits, and the attendant complications of enrichment and control in producing consumer fuel with a stable Btu content, is a familiar story to any gas man. To the layman, however, the loss or gain of a few Btu is of little consequence unless his burners do not function properly and require constant adjustment, or unless the bills seem out of line. Nevertheless, both the gas producer and the consumer are affected by the gambolings of a few Btu in manufactured gas.

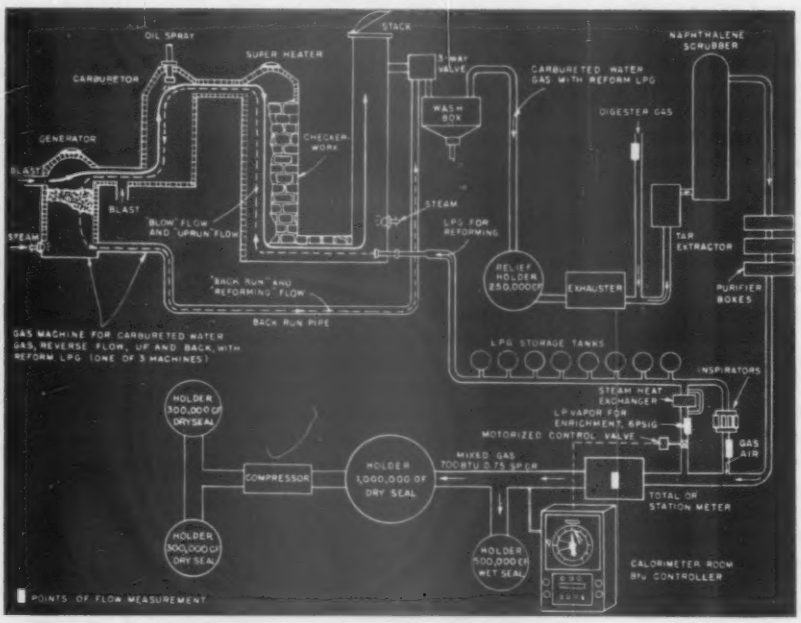
Because of severe operating conditions and the fluctuating nature of the make-up gases, the Waterloo gas manufacturing plant of Iowa Public Service Company has the dubious distinction of being one of the toughest and most contrary city gas manufacturing operations in the country. Utilizing, at present, five basic make-up gases to produce a 700 Btu mixture, the plant has grown like Topsy. New gases have been steadily introduced over the course of the years to increase gas production and enrichment. Prior to 1952, Btu control was strictly a manual operation. Accordingly, the results, although fair considering the many processing variables, were far from satisfactory. With the installation of a new Caloroptic-electronic Btu control system, the heating value of the final mixed gas was held closer than was previously believed possible. Not only were consumer complaints reduced, but the equipment amortized itself in a few months.

About everything varied

To get an idea of the extreme complexity of the operations at the Waterloo plant, study the following brief description of the component gases for the final 700 Btu mixture:

1. *Carbureted water (blue) gas*—It usually constitutes over three-fourths of the volume of final mixture. This gas is produced in three gas machines which burn high grade bituminous coal. The oil employed for carburetion varies from fuel oil mixtures to petroleum wax.
2. *Digester (sewer) gas*—This gas, purchased from the city sewage disposal plant, varies widely in flow rate from 80 to 300,000 cubic feet per hour, depending upon seasonal make-up. Also, over 60% of this gas comes from a large packing plant whose output and, therefore, gas producing potential cycles radically every day. Sewer gas makes up roughly 10% of the final finished gas mixture.
3. *Liquefied petroleum gas vapor*—Constituting about six % of the finished mixture volume, LPG vapor is the final additive to the mixture for enrichment purposes to maintain the desired 700 Btu/cf value. Ordinarily, butane is used as the LPG, but propane is occasionally employed.
4. *Reformed liquefied petroleum gas*—In addition to the carbureted water gas produced at the gas machines, reformed LPG is also manufactured. This make-up fraction comprises about five % of the finished gas volume. This gas has a low gravity and requires LPG air gas to raise the gravity to 0.75.
5. *Liquefied petroleum-air gas*—This constituent, often termed LP-air gas, gas-air, or air gas, is used only in minute quantities for adjusting the specific gravity of the final gas.

SCHEMATIC FLOW DIAGRAM OF CITY GAS MANUFACTURING PROCESS



The demand side of the process produces additional complications because of the wide variance (from 1,200,000 to 5,600,000 cf/d) of the total distributed gas. Heat-treating and similar gas-fired processes at one large industrial user (about 30 MMcf per month, nominal) play a major role in establishing total gas demands.

The process is clearly stamped with complexity, variability and contrariness.

Controller regulates heating value

Operations at this plant are more completely and easily described by reference to the schematic flow diagram. Carbureted water (blue) gas, plus reformed LPG, is produced in one Semet-Solvay reverse-flow and two U.G.I. machines. The resultant carbureted water-reform LPG gas output is blended with digester (sewer) gas of 0.82 specific gravity from the municipal sewage plant. After cleansing operations, removal of tars, naphtha-

lene, ammonia and other impurities, proper gravity is maintained by the addition of air gas from a battery of four inspirators. The mixture is finally enriched with LPG vapor to reach a 700 Btu base. Flow metering equipment for accounting purposes is employed as noted in the diagram.

Final control of the heating value of the mixture is regulated by the master controller, the Connelly Caloroptic Btu controller, located in a separate specially-built control building. The sampling line for the controller is located downstream from the total or station meter. Briefly, the controller actuates a valve on the LPG vapor line to hold the final mixture's Btu content within certain fixed tolerances.

Novel control method

The Btu control system, manufactured by Connelly Inc. of Chicago, employs a series of electric, photo-electric and electronic devices to translate the heating value of a gas into a continuous electrical signal for recording and control purposes. A gas sample is continuously passed into the Caloroptic detecting element, which comprises a pressure regulator, a calibrated burner tube and Western Photoronic cell.

Operation of the calibrated burner tube is based on the principle that the volume of air required for perfect combustion of a gas is a direct function of the heating value (Btu content) of that gas. The calibrated burner tube is equipped with a micrometer-type adjustable sleeve which varies the amount of primary air passed through the tube. The tube is set with considerable yellow in the flame at the control point and then changes up or down in this value produce the control action.

Here an operator is shown checking operation of Connelly Caloroptic Btu controller. The cubicle housing this master controller is mounted in a separate control building.

Caloroptic operation is such that the gas passage is from the sampling line, through the pressure regulator, to the burner tube, where it is mixed with a precise quantity of air and finally burned. A Photronic cell focused on the resultant flame, generates a certain micro-amperage depending upon the luminosity of the flame. This generated micro-amperage thus varies in proportion to the flame luminosity (the flame luminescence depends on the completeness of combustion) which, in turn, varies with the heating value of the gas mixture. Since the adjustable sleeve on the calibrated burner is set to zero the Caloroptic with 700 Btu on the recording calorimeter, any increase or decrease in Btu value of manufactured gas will result in a different colored flame and in varying current output of the photo-electric cell.

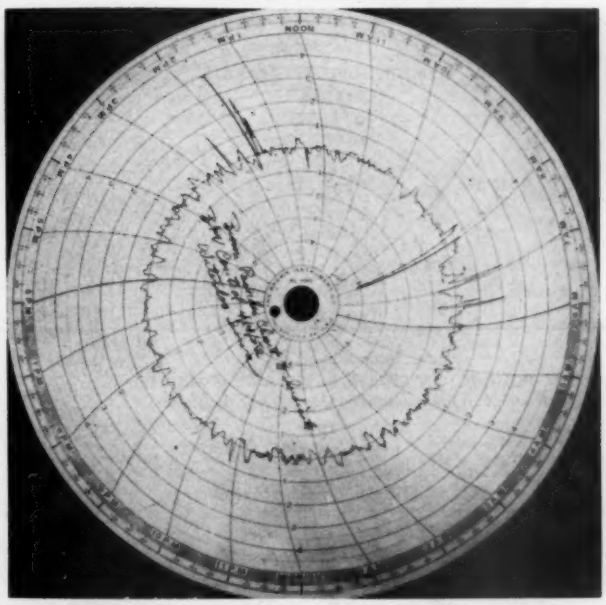
Output of the photo-electric cell is fed into a Minneapolis-Honeywell electronic potentiometer recorder-controller mounted on the front of the cubicle.

The intensity of the input signal is measured with a shunted potentiometer circuit in the controller which provides both instantaneous indications and a permanent record together with control action. Four mercury switches in the controller, together with a specially-designed interrupter circuit provide either short or long pulses to the motorized gate valve on the LPG vapor line. These pulses occur once a minute when the interrupted circuit is energized. Length of the pulses depends upon the distance of the recording pen from the set point.

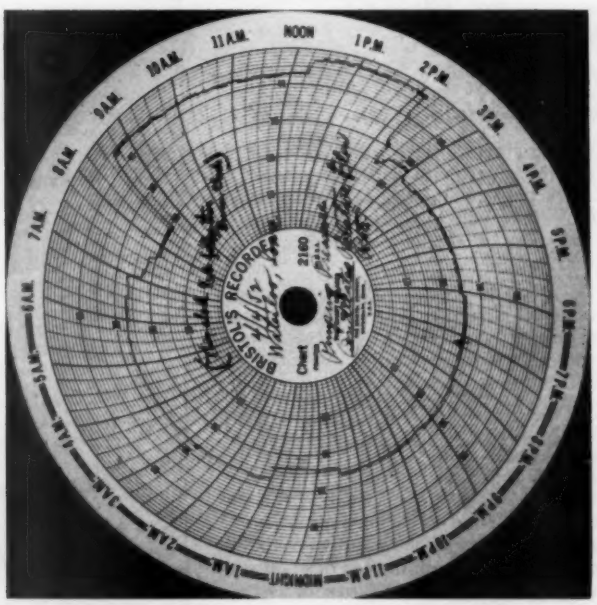
It is important to note that excellent results were achieved even though modulating type interrupted control with a non-throttling gate valve was utilized in order to take advantage of existing equipment. Proportioning or throttling type control with reset action which provides

(Continued on page 32)

BTU CONTROLLER RECORD



PUMPING PRESSURE RECORD



Each cardinal division on the chart record from the Btu controller represents approximately 10 Btu. The record of pumping pressure, made on the same day as the record of the Btu controller, is a half hour ahead because of different chart-drive motor settings.

Gas Utility Service Policies Summarized in AGA Survey

GAS utility interest in service policy problems is indicated by responses, covering 96% of the meters of American Gas Association member-companies, to a 400-question check list prepared and distributed by the AGA committee on customer service responsibility.

The committee's analysis of the heavy response to the questions on details about company service problems and certain other related matters was revealed at the AGA distribution, motor vehicles and corrosion conference, in Chicago, during mid-April.

The survey covered service policies for all common customer requests such as adjustments, lubrication, cleaning, turn-on turn-off, replacement and repair. Appliances for which this information was secured in the survey included ranges, water heaters, refrigerators, central heating units, floor and wall furnaces, room heaters, commercial and industrial appliances. Supplementary questions related to standards, codes and inspections.

The committee report on the customer service responsibility survey, given at the conference by C. George Segeler, AGA utilization engineer, included also a statement of good practices relating to utility responsibility to customers and the customers' own responsibilities.

Five points of good utility practice were enumerated by the committee:

GAS SUPPLIED Each utility is urged to distribute gas with sufficiently uniform characteristics and pressures as to permit the proper performance and satisfactory operation of appliances throughout the year.

INFORMATION FOR CUSTOMERS Each utility is urged to inform its customers regarding the extent and character of the appliance servicing which the utility is currently prepared to render.

APPLIANCE ADJUSTMENT SERVICE Each utility is urged to provide, upon customer's request, prompt and efficient appliance adjustment service, preferably with the cost of such service included in operating expenses to the extent reasonable and practical. This service should be rendered to all gas appliances meeting prevailing minimum standards of safety, without distinction as to appliance warranty or point of purchase; provided that in the judgment of the utility the appliance can be restored to a proper operating

Table 1
FREE AND CHARGED SERVICE
By percent of total reporting meters

APPLIANCE AND SERVICE	UTILITY COMPANY SERVICE		CHARGED SERVICE BY OTHERS
	Free	Charged*	
Ranges			
Burner adjustment	83.5%	16.0%	0.4%
Control adjustment	78.4	21.0	0.4
Lubrication	75.0	21.8	3.1
Water Heaters			
Burner adjustment	84.7	14.6	0.4
Control adjustment	82.0	17.4	0.4
Lubrication	75.3	19.8	4.5
Cleaning flues and burners	58.5	24.6	16.6
Refrigerators			
Burner adjustment	79.5	15.7	4.5
Control adjustment	73.7	17.8	7.7
Cleaning flues and fins	49.5	34.4	15.2
Central Heating			
Burner adjustment	81.4	18.0	0.4
Control adjustment	77.7	19.8	2.2
Lubrication	71.0	19.4	9.5
Periodic clean out	27.0	24.2	47.8

* Includes 2% (approximate) where charges are higher than cost.

Table 2
REPAIR AND REPLACEMENT OF PARTS
By percent of total reporting meters

APPLIANCE	UTILITY COMPANY SERVICE			OUTSIDE AGENCY SERVICE
	Free	At Cost or Less	Above Cost	Charged
Ranges	17.8%	37.5%	17.5%	27.2%
Water Heaters	19.0	44.6	17.2	19.0
Refrigerators	10.9	46.4	24.7	23.0
Central Heating	4.5	36.4	17.4	40.0
Floor and Wall Furnaces	4.7	39.3	16.2	40.1

Table 3
SERVICE POLICIES ON DEALER SALES AND WARRANTY
By percent of utility companies that service appliances

APPLIANCE	SERVICING DONE		
	On Appliances sold by Others	In Warranty	Out of Warranty
Ranges	99.3%	80.4%	99.2%
Water Heaters	98.1	81.4	97.2
Refrigerators	97.1	83.3	97.5
Central Heating	99.0	72.0	97.0
Floor and Wall Furnaces	97.3	71.5	97.2

Table 4
INSPECTION AND STANDARDS
By percent of total reporting meters

	Ranges	Water Heaters	Refrig.	Central Heat. Equip.	Floor, Wall Furnaces
NEW INSTALLATIONS					
Own installations inspected by gas company	59.9%	51.8%	58.8%	40.4%	40.3%
Installation by others inspected by gas company	21.2	35.6	38.5	55.9	52.0
Installations specifically covered by city code	32.0	55.6	30.7	52.3	48.2
COMPANY PRESCRIBES					
Minimum equipment standards beyond A.G.A. Approvals	11.2	18.0	12.3	34.2	23.8
Minimum installation standards	70.9	76.8	77.5	77.0	68.7

Table 5
SIGNIFICANCE OF INSTALLATION INSPECTIONS
By percent

	Ranges	Water Heaters	Central Heat. Equip.	Floor, Wall Furnaces
Sold by gas company	13.0%	13.7%	5.0%	4.4%
Sold by gas company and inspected by gas company	59.9	51.8	40.4	40.3
Sold by dealers	87.0	86.3	95.0	95.6
Sold by dealers and inspected by gas company	21.2	35.6	55.9	52.0
All appliances inspected	26.1	37.8	55.2	51.5

Table 6
FREE AND CHARGED SERVICE
By percent of total reporting companies
S = Straight gas companies
C = Combination gas-and-electric companies

	FREE SERVICE		CHARGED SERVICE		CHARGED SERVICE BY OTHERS	
APPLIANCE AND SERVICE	S	C	S	C	S	C
Ranges						
Burner adjustment	83.6%	70.9%	14.7%	27.8%	1.7%	1.4%
Control adjustment	80.1	61.1	17.6	37.3	2.3	1.4
Lubrication	67.7	61.1	26.1	34.4	5.7	4.2
Water Heaters						
Burner adjustment	84.6	73.6	13.6	25.0	1.7	1.4
Control adjustment	81.2	69.5	16.6	29.1	2.2	1.4
Lubrication	71.2	61.1	21.6	33.2	6.3	5.6
Cleaning flues and burners	56.3	44.5	31.4	40.4	10.3	15.3
Refrigerators						
Burner adjustment	85.3	69.5	11.4	23.3	2.8	5.6
Control adjustment	80.8	59.7	14.3	26.4	4.6	11.1
Cleaning flues and fins	56.8	36.2	34.0	43.1	8.0	15.3
Central Heating						
Burner adjustment	78.5	75.0	16.9	23.3	4.5	1.39
Control adjustment	76.2	70.9	17.5	25.0	6.2	4.2
Lubrication	69.5	62.5	19.3	30.6	10.8	6.9
Periodic clean out	29.1	29.1	21.1	15.3	49.0	52.9

condition. The above does not imply that the utility need be the exclusive agency for providing appliance adjustment service. Where the utility finds improper installations made by others, it is urged either to correct such installations or to refer the customer to an appropriate service agency.

PARTS REPLACEMENT SERVICE In the absence of adequate service by other parties, each utility is urged to offer at reasonable charges to its customers, parts-replacement service on gas appliances which meet prevailing minimum standards of safety, without distinction as to appliance warranty or point of purchase, providing that the appliance can be restored to proper operating condition. The availability of the necessary parts is the responsibility of the appliance manufacturer or his designated representative.

TRAINING OF INSTALLATION PERSONNEL Whenever required, each utility is urged to assist appliance manufacturers and their local representatives in the training of appliance installers to conform to local ordinances, building, plumbing, and other codes, in order that gas appliances shall be properly installed, initially adjusted and serviced with replacement parts; and assist them in making field checks to determine the effectiveness of the training program.

Five other points of good practice were included in the committee report for manufacturers:

APPLIANCE QUALITY Manufacturers are urged to build appliances of such design and construction that proper performance and operation may be obtained over a normal appliance life with minimum adjustments and parts replacements, and with reasonable accessibility for such service.

REPLACEMENT PARTS Manufacturers, directly or through their designated representatives, are urged to provide replacement parts and local qualified service personnel for the installation thereof and to have them available promptly to the customer during the normal life of the appliance. But manufacturers should not be called upon to provide replacement parts unless in their judgment the appliance can thereby be restored to proper operating condition.

WARRANTY The manufacturer should fully and fairly live up to any warranty which he has made.

INSTRUCTION MATERIALS Manufacturers, directly or through their designated representatives, are urged to make available to local installation and service personnel adequate and readily understandable instructions so that the appliance may be properly installed, adjusted, serviced and operated and to make available to the customer readily understandable operating instructions.

TRAINING PROGRAM Manufacturers directly or through their designated representatives, are urged to provide, whenever required with the assistance of the

(Continued on page 30)

Southern Gas Association's 45th Meeting He

WITH a total registration of close to 1,700 delegates and guests, Southern Gas Association concluded the largest and most successful convention in its 45 years of history on Wednesday, May 13 in New Orleans, by electing H. K. Griffin of Mississippi Valley Gas Company, Meridian, Miss., to the office of President of SGA for the ensuing association year.

Other officers elected in the terminal general session of the three-day meeting included:

1st Vice President: C. I. Wall, Lubbock, Tex.

2nd Vice President: J. H. Collins, Sr., New Orleans, La.

Treasurer: H. V. McConkey, Dallas, Tex.

Secretary: Earl J. Newlin, Oklahoma City, Okla.

Assistant Secretary: Kyle H. Turner, Atlanta, Ga.

Chairman Advisory Council: John C. Flanagan, Houston, Tex.

Vice Chairman Advisory Council: Hansell Hillyer, Savannah, Ga.

Directors: Carl E. Cloud, Little Rock, Ark.
C. L. Perkins, El Paso, Tex.
Charles K. Oxford, Columbus, Ga.
James A. Davis, Fort Worth, Tex.
H. C. Hotze, Tulsa, Okla.
B. G. Duncan, Charlotte, N. C.

Chairman Nominating Committee: L. L. Dyer, Dallas, Tex.

The largest and most autonomous of all the regional gas associations, SGA conventions are marked by completely-rounded programs that embrace every phase of gas operation from transmission to distribution and sales. Although sales and merchandising problems loomed large on the agenda, there were papers and forum discussions on such widely diversified subjects as accident prevention, accounting, distribution, employee relations, home service, industrial gas sales, residential sales, and transmission.

SGA motion picture premiered

An outstanding SGA project that has been nearly four years in the making, is a new motion picture, in sound and color, titled Natural Gas. Viewers at the premiere showing in New Orleans agreed that it is the most outstanding presentation made to date of every phase of gas industry operation, translated into terms of customer-interest. The picture is designed for widespread showing before local groups, and prints are available through SGA for any gas company that wishes to use it as a combination educational and good-will builder in its own service area.

The president's address of John H. Wimberly, Houston, emphasized the unique round table discussion technique the SGA has utilized in recent years as the focal point for local meetings within association member areas. During the past year, he said, 28 such seminars, each devoted to the discussion of one aspect of industry business by those engaged in it, were conducted. He paid a tribute to the natural gas transmission companies as the "empire builders" of to-day, and urged that they, as well as the gas producer, join the distributing utilities and the gas appliance manufacturers in building up the resident load of the industry. Mr. Wimberly also presented the proposal that the gas industry adopt a nation-wide financing plan for gas appliances, under which every approved appliance sold by a dealer as well as by a utility would be eligible for installment selling, with collections made by the gas companies along with their monthly bills.

Industry preoccupation and concern with maintaining and expanding its domestic base load was the subject of numerous other speakers. Frank C. Smith, Houston, president of American Gas Association and past-president of SGA, presented the highlights of the Gas Industry Development Program that has been approved by most of the major gas companies, as well as by appliance manufacturers who are members of Gas Appliance Manufacturer's Association. Included in the program are: (1) acceptance of sales responsibility by the utility, (2) increased sales and dealer promotion of appliances, (3) special attention to new homes and replacements, (4) emphasis on big quality appliances, (5) improved service and safety practices, and (6) market analysis of its area in terms of major appliances by every gas company.

Appliances, sales and promotion

On the subject "What's Good About Today's Gas Appliances," Edwin L. Hall, director of the AGA laboratories, said, "The cooking market will be largely ours again when we recognize and correct past mistakes." He urged the promotion of the high broiler as a must for today's cooking. He also invited his audience to think about improvements that could be made in gas ranges, and to pass those ideas along to manufacturers and the AGA laboratory. In the field of water heaters he said, "Too few of the water heaters sold are premium delux units that will provide years of trouble-free service." Mr. Hall emphasized the necessity of promoting the comparatively new base-load appliances, incinerators and laundry dryers, saying that there are now 43 manufacturers either producing or preparing to make gas-fired dryers.

Harold P. Bull, Bendix Home Appliances, South Bend, Ind., outlined a comprehensive program of fundamentals to strengthen utility-dealer relationship. His theme was that the utility is responsible for the calibre of salesmanship that exists in its area, among both its own salesmen and those of appliance dealers. He called upon gas company management to immediately inaugurate a program of education and training of dealers and dealers' salesmen, public demonstrations of appliances at utility and dealer levels, cooperative advertising with dealers, free hook-up in dealer floors for live demonstrations, low flat-rate installations, including dealers in gas company publicity, adequate utility manpower to call upon, assist and encourage gas appliance dealers. He suggested that there should be a 1954 Blue Flame Crusade to be staged by manufacturers, distributors, dealers and gas utilities.

Cecelia Maloney, Miami, augmented the argument for improved selling techniques by presenting a skit showing how the clothes dryer can be sold by salesmen calling at the prospect's home.

In a general sales session, one of the best attended of the parallel meetings of the convention, C. L. Brockschmidt, Shreveport, discussed the "Economics of Saturation," urging the vital necessity of building up gas consumption through base load appliances such as ranges, water heaters, refrigerators, incinerators and dryers, to compensate for the peaks that are being encountered through the rapid growth of gas house-heating. He pointed out that while underground storage is mitigating the effect of daily and seasonal peaks, the most essential prerequisite to economical and profitable operation is a gas load as nearly balanced as possible, winter and summer.

W. H. Ligon, Nashville, spoke on behalf of AGA's PAR (promotion, advertising, research) plan, pointing out that during 1953, $410,000 of PAR funds will be spent for promotional activities, and $925,000 for national advertising. He gave his audience a preview of the association's new dealer program, Pattern for Profit, that is in preparation, to be ready for release within a few weeks.

Record Attendance and Well-Rounded Program

The Pattern for Profit program was explained in greater detail in another sales session by H. C. Webb, who illustrated his talk with slides showing the various mailing pieces, pamphlets and instruction booklets that comprise the kit, which is to be distributed through the local gas companies.

A strong plea for year-round air conditioning as one solution to the problem of heating load peaks was presented by L. C. Roberts, Dallas. He pointed to the climatic conditions in The South, and to the tremendous building expansion now under way there as indications that SGA territory is the Nation's number one year-round gas air conditioning market, "where the battle for sales will be the most intense."

In a live dramatization of the superiority of gas over electricity as a commercial cooking fuel, F. A. Kaiser, Detroit, presented his demonstration "Mr. Flameless and Mrs. Flame," a presentation that he has made 24 times during the past two years, largely to restaurant and hotel groups of commercial cooking prospects.

Safety

Accident prevention and safety were accorded a full measure of consideration during the three day SGA convention with two forums featuring three speakers and a round table discussion held jointly with members of the AGA accident prevention committee.

Principal speaker in one session was Val Jean McCoy, Houston, who delivered a paper on "The Three R's of Safety," these being: Reflective Thinking, Respect for Hazards and Responsibility. Under reflective thinking he pointed out that all accident sources fall into two categories, unsafe practices and unsafe conditions. It is up to management to recognize these sources and to specifically plan for their elimination. Respect for hazards must also be inculcated in employees by management through unremitting education on the theme of self-preservation by the employee himself. Responsibility for safety is shared by everyone, employer and employee. "Let us work," he said, "to establish a concept of employee liability in the mind of every worker. Let's make him fully conscious of his responsibility to himself, to his family, and to his fellow workers."

W. A. Johnson, Jr., Owensboro, Ky., urged for more human safety programs, with management accepting the premise that accident prevention is an attitude and a persistent policy, allied to human relations problems. He pointed out that avoiding financial losses through preventable accidents is in itself good incentive for a gas company to be safety conscious at the supervisory level, but to be really successful the program must be primarily concerned with the welfare of individual people, whether they be employees or customers of the general public.

During the round table discussion, under the chairmanship of E. E. Edmondson, Jr., Shreveport, many experiences and practices of SGA member companies were presented. Wm. H. Adams, safety consultant with AGA spoke briefly on the improvement in the gas industry's safety position on a national scale during the past two years.

Distribution

Subjects covered in the two distribution sessions of the convention ranged from employee training to the use of plastic pipe and included one panel discussion on motor vehicle operation and maintenance. L. R. Pickup of Los Angeles analyzed the experiences of his company, Southern California Gas Co., in the use of more than a million and a half cubic feet of plastic pipe for service piping. The few failures reported have practically all been attributed to careless backfilling after the line has been connected to the service main and riser. At present the laboratories of the company are testing plastic pipe and fitting, in sizes of 2" and larger, looking to its use in distribution main construction, but to date no plastic mains have been installed.

Two symposiums were conducted under distribution auspices, one on Analysis of Periodic Repair Practices with L. A. Bickel, Dallas, as moderator and the other on Practical Service Training Programs, in which Dwight H. Woods, Nashville, W. M. Nunn, Sr., New Orleans, Herbert Luoma, Birmingham, and J. T. Ross, of United Gas Corp., participated.

E. M. Kelley, of El Paso, described the problems of his Southern Union Gas Co. in operating motor vehicles in every range of altitude from sea level to 12,000 feet. The company maintains 454 trucks over its system in Texas, New Mexico and Arizona. He emphasized the necessity for driver courtesy, pointing out that every company vehicle is in effect a movable billboard, and as such can do much to influence public good will toward the utility.

Transmission

Outstanding in the transmission session was a discussion by Dr. Frank H. Dotterweich, Kingsville, Texas, on the use of gas jet compressors to entrain low pressure gas into higher pressure lines by employing the energy of the high pressure gas at the point of pressure reduction to draw low pressure gas into the stream. Thus, potentially useful energy, normally wasted, is used. After some preliminary experiments in the design of apparatus to achieve this jet entrainment, Texas College of Arts and Industries, of which Dr. Dotterweich is director of the division of engineering, submitted the problems to several compressor manufacturers. The only one to take an interest in the subject was Worthington Corp., of Harrison, N. J. George R. Fletcher, engineer with that corporation was assigned to the project and made further developments and refinements that eventually resulted in the compilation of some basic data available for general use.

Mr. Fletcher followed Dr. Dotterweich on the program, giving the audience some factual information on the use of gas jet compressors. Advantages are that the installation costs are very low, since the whole apparatus is little more than a few fittings they require little servicing and maintenance. Disadvantages are that the system can only be used at points where pressure in the high pressure line supplying the energy, is to be reduced, and the overall efficiency of an installation is usually on the order of 20%.

A detailed discussion of the experience of Mississippi River Fuel Corp., Tennessee Gas Transmission, and El Paso Natural Gas Co. with gas turbine centrifugal compressors was given by George C. Cooper, George White and E. A. Walsh. Mr. Cooper's observations indicated that the 1,850 hp internal combusion gas turbine, coupled to a centrifugal compressor, as tried out by Mississippi River Fuel Corp. has proven to be a practical unit for compression of pipe line gas. The unit used 238 gallons of fuel oil or 28 Mcf on natural gas per hour at full horsepower output, using 16,000 Btu per hour per brake hp.

An informal panel of gas transmission was also conducted under the chairmanship of O. W. Clark, Birmingham. Phases of transmission operation including dispatching, pipeline operations, radio communications, rights of way, gathering and processing and compressor station operation were considered.

Biggest regional association

Managing Director Robert R. Suttle informed his association members that SGA membership is at an all-time high in its history, and that it is the largest regional association in the gas industry from the standpoint of membership, territory covered, association activities and convention attendance.

He urged Association members to be outspoken in their demands for any new or expanded service that they feel SGA should make available to them.

The convention was under the general chairmanship of Charles F. Stubbs, Birmingham. In the closing session the time and place committee announced that the 1954 Convention will be held in Houston, the last week in April, and in mid-May, 1955, it will return again to the scene of its 1953 gathering, New Orleans.

Attention to the Dealer's Role Dominates Sales Conferences

CONTINUED concern over the base load, with particular emphasis on the role of the dealer in selling the gas appliances required to retain it, dominated the consideration of gas industry participants in two regional sales conferences held recently under the auspices of the residential section, American Gas Association.

The Mid-West Regional Sales Conference in Chicago, April 27 to 29, drew an attendance of over 600, while 200 were registered at a similar Eastern conference in Pittsburgh the week following.

At both meetings Frank C. Smith, AGA president, and the industry's number one exponent of aggressive merchandising, was one of the featured speakers. President Smith's theme in both instances was a strong plea for industry unity in support of the Gas Industry Development program now being backed jointly by gas utilities and appliance manufacturers.

Also on the program of both meetings was Lyle C. Harvey, director, treasurer and past president, Gas Appliance Manufacturer's Association. The Harvey theme, taken as representative of the opinions and hopes of the manufacturers he represents, is that only an aggressive utility sales policy can reestablish the gas industry in the eyes of the consuming public. He advocated direct merchandising by the gas utility, with a strong program of dealer cooperation as part of such a program. "We need better merchandising," he said, "just to hold our own in the competitive market that exists today."

Carrying the theme to specific recommended practices and on various base load appliances, other speakers from both utility and manufacturing circles held forth on ways and means for the industry to go about its new industry development plans, transforming the admittedly sound merchandising premises into terms of actual sales.

The several AGA programs, under way to assist utilities in their selling and dealer-cooperation plans, were presented. Clifford Hall outlined the association's carnival of sales, a plan whereby each type of appliance is given individual promotional attention. In the Eastern meeting, H. V. Potter developed the same theme with a program, "Seven Keys to Progress," the seven keys being the seven basic uses for gas.

The 1954 gas appliance promotional schedule under AGA auspices was tentatively announced as follows: February and March, water heaters and laundry dryers; April and May, ranges and year round air conditioning; June and July, refrigerators and incinerators; September and October, ranges and water heaters; November and December, dryers. The details of the 1954 plans will be ready for distribution to gas utilities in October 1953.

Robert J. Caniff, advertising and sales promotion consultant, Chicago, urged the great need for training in selling at the retail level. He also observed, "I can see no reason for a utility to get out of merchandising. Under a sound merchandising and dealer cooperation program both the utility and all of its participating dealers benefit."

Competition must be anticipated and overcome, all along the line from appliance to service, said R. E. Williams, district manager, Binghamton Gas Works, at the Pittsburgh meeting. "Failures and lack of customer service," he stressed, "may determine the success or failure" of appliance and load-building promotions. Service still is foremost, he maintained, because customers are being sold more gadgets. He appreciated that such service must be kept on despite higher operating costs.

A four-point program by Mr. Williams included: (1) making customers more conscious of the good quality of gas ranges; (2) providing prompt and efficient utility handling of leakages, outages and other emergency calls; (3) inspecting all installations because a gas appliance really is not sold until it is working to the consumer's satisfaction, and (4) informing customers in advance of services, adjustments or related changes—which should be featured prominently in all promotions. "We must develop the customer's welfare—for our own future," he added.

As new home-building goes, so go replacement and rehabilitation sales of gas appliances for older homes, stated James E. Cook, manager, utilization division, Consolidated Edison Company, New York, in introducing his subject, "Selling The New-Home Market." As house-heating goes, Mr. Cook advised, so go the gas cooking and water heating loads. More closely dovetailed work with builders to convince them of the merits of gas fuel and gas appliances, is profitable only before homes are built.

Mr. Cook emphasized the need for gas utilities to work with home architects and contractors. He stressed: assigning special personnel to this work; offering kitchen and laundry planning aids; advertising cooperatively with builders; participating in model homes; encouraging gas appliance manufacturers to sell directly to builders of developments, and up-grading appliances.

Seven speakers of the Eastern conference reviewed the "Seven Keys to Progress" in gas appliance sales.

Low installation cost and simple operation of automatic gas-fired incinerators both contribute to building all-year gas loads, said J. G. Dierkes, president, Bowser, Inc. He foresaw greater sales in the offing for the improved modern versions of gas incinerators which now are helping to pace gas appliance sales. Such sales hit a new-high last year, encouraged by incinerator-conscious companies in cities including Cincinnati, Detroit and others.

Air conditioning, originally a home luxury, today offers a real volume market as basic as househeating, in the opinion of John A. Gilbreath, assistant vice-president of air conditioning, Servel, Inc. He felt that the basic need of summer cooling to complement winter heating would strongly help promote all-year-around gas appliance sales and build gas loads. He cited air conditioning as the means of providing a complete line of competitive products for all markets. Three basic gas industry needs further outlined by Mr. Gilbreath comprised: adequate and continuing gas supply to tie-in summer cooling and winter heat; better understanding of gas air conditioning costs and operation by builders, utilities and salesmen, and fully developed and coordinated sales effort.

Frank McFerran, general sales manager, Ruud Manufacturing Co., introduced the theme "the hotter the water the whiter the wash," for greater gas water heater sales. Postwar sales of water heaters using utility gas have risen 172% over prewar in the generally rising market of all-types of hot water heaters.

Automatic gas clothes dryers were heralded by Don H. Davidson, sales promotion manager, Whirlpool Corp. He hailed the dryer as adding to the glamour of gas industry appliances and building the gas load. Mr. Davidson predicted that 800,000 gas dryers would be sold this year and would lead the field within two years.

Al Lee, director of utility division, Servel, Inc., expounded on cold cooking through gas refrigeration. He called for a revival of selling refrigerators, the only kitchen device that operates 24 hours a day. He termed refrigerators "our neglected old sellers" but countered that Servel's new ice-maker models not only sell themselves in the saturated refrigerator market but help move other gas appliances as well.

Cooking with gas, on modern automatic gas ranges, was represented by the O. J. Haagen, district manager of Tappan Stove Co. "Let's avoid using cheap gas ranges as bait to attract buyers into stores," he pleaded. To counteract this situation, he suggested spending more time with salespeople who do the final selling. He said they should be provided with a simplified line of step-up ranges to help upgrade range sales which build a solid basic gas load. "Don't shout price," he shouted, "but cash in on high quality automatic gas ranges."

Concentric Catalytic Generator Design Improved

by Virgil Stark

President

North American Utility & Construction Corp.

SINCE the publication of the description of a new type of concentric catalytic generator [AMERICAN GAS JOURNAL, July 1952], important improvements have been made through studies connected with practical application.

The improvements in the system and design, together with their consequences will be indicated here.

The concentric catalytic generator allows for increase in volume, because of the gradual temperature increase, of the feed mixtures in the concentric cylinders with increasing diameter and passage. In this way, the velocity of the feed mixture is maintained low and so is the velocity at the entrance in the catalyst mass in the last cylinder section.

The low velocity allows a long contact-time for reforming in the presence of the catalyst and a reduced generator height, approximately one-third of the tubular type. However, in the catalyst section the volume of gas approximately doubles because of the reforming and as the cross surface in the catalyst section, between the last two cylinders, remained constant, the velocity of the gas in the catalyst mass increased accordingly. The additional heating in this section contributes also to the increase in volume and capacity. No provision was available before for the increase in volume in the catalyst section.

This increase in velocity in the catalyst was considered when figuring the capacity of the generator based on a predetermined estimated contact-time.

In the new design, the last shell of the generator body is made in a conical form instead of cylindrical. As the second shell remains cylindrical, the cross section between the shells in the catalyst mass will increase gradually and will compensate for the increase in volume due to the reforming. In this way the velocity will not increase due to the reforming and additional heating in the catalyst section. By maintaining the velocity lower than before, the available contact-time will increase. For a generator with the same general size of body, the capacity will increase for the same allowable time of contact.

The increased capacity, more than 30%, reduces the cost for a generator of chosen capacity.

Increase in thermal efficiency

The thermal efficiency depends on: (a) required heat input for heating feed mixtures and reforming reaction; (b) flue gas losses; (c) radiation losses.

Heat input for reforming is required for the endothermic reaction with steam. Reaction with air is exothermic. As the reaction with air is violent and rapid, the reforming feed will take all air available and only the balance of reforming feed will react with the steam. As the exothermic reaction develops heat and is prior to any endothermic reaction, the temperature will increase substantially.

In the tubular-type generator, a temperature increase at certain locations on the long tubes presents a danger of burning the tube and, therefore, reaction with a high percentage of air is avoided for this type of generator.

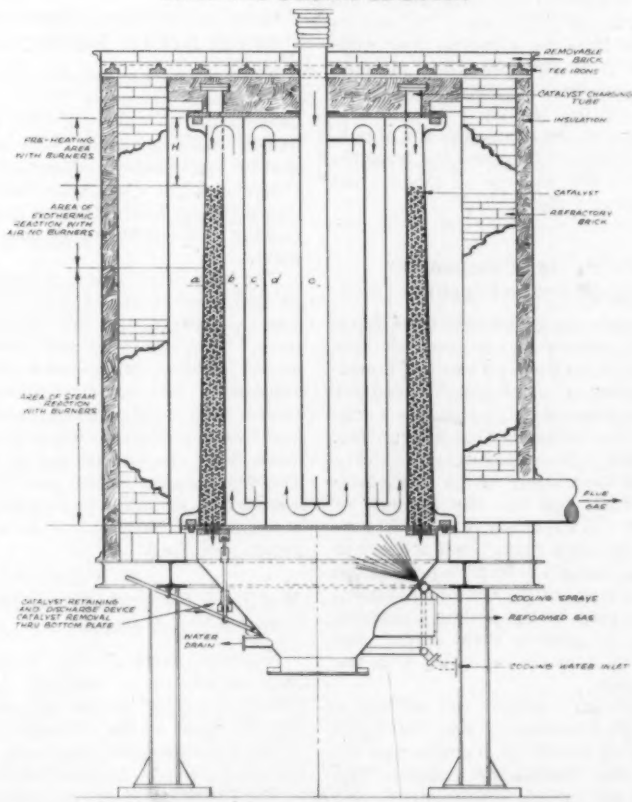
The concentrical generator, with its reduced height much larger and thicker outside shell (average 8 times the diameter of a tube), will allow the increase in temperatures without burning danger. The temperatures in the combustion chamber can be lower because of the longer contact-time allowable in the reforming mass.

A new disposition of the burners, generally 7, has been provided for the concentric generator so that there is no direct heating at the location where the exothermic reaction is estimated to take place.

The proportion of reaction with air and steam can be selected depending on the quality of the reformed gas desired. The reaction with air may reduce considerably the heat input required. The heat of reaction is, for instance, 6 to 12 times lower (depending on the feed) when the proportion of reaction with air is 75% as compared with reaction with steam alone.

As the reaction with steam requires an excess of steam the volume of feed mixture is larger for steam reaction only and

(Continued on page 37)



Cross-section diagram of the improved concentric catalytic generator.

FEDERAL POWER COMMISSION

Companies' Operating Revenues and Incomes—March 1953

Operating revenues of natural gas companies reporting to the Commission totaled $223,909,775 in March of 1953, an increase of 16.4% over March 1952. For the 12 months ended March 31, 1953, revenues aggregated $2,053,043,078 or 18.5% higher than in the same 12 months of 1952.

Gas utility operating income for March 1953, amounted to $35,548,461, up 3.1% from March of last year. For the 12 months ended March, 1953, an increase of 12.5% was recorded over the comparable period in 1952.

Net gas utility plant of the reporting companies aggregated $5,054,018,241 on March 31, 1953, up 11.1% over the 1952 report.

Gas operating revenue deductions during March, 1953, amounted to $188,523,966, an increase of 19.3%. Of this total, operating expenses accounted for $140,328,140; depreciation, $15,953,100; taxes, $32,242,726.

Gas sales to ultimate consumers during the month were 265,067 MMcf, an increase of 5.3% over March, 1952.

Sales to residential and commercial consumers decreased 2.2% and 0.7%, respectively, while those to industrial consumers increased 12.5%. Revenues from all sales to ultimate consumers increased 10.8% and amounted to $106,116,917.

Net income of the companies for March, 1953, was $28,067,848, down 2% from the March, 1952, net. For the 12 months, net income increased 5.4%.

Gulf Interstate Gas Company to Construct 860-mile Pipeline

The Commission authorized Gulf Interstate Gas Company to construct an 860-mile pipeline from the Gulf coast of Louisiana to a point in northeastern Kentucky for transportation of natural gas for a subsidiary of The Columbia Gas System, Inc.

The project, estimated to cost $129,541,000, will be used solely in the transportation of natural gas for the account of United Fuel Gas Company, which will purchase and own all the gas. Upon delivery to United Fuel, the gas is to be a part of the pooled gas supply of the Columbia System and will be used by the certain Columbia subsidiaries in meeting their annual and peak day requirements beginning with the 1954-55 winter.

Gulf Interstate's system will include a single 30-inch transmission line, 860 miles long, a total of 40,000 hp in compressor facilities in five compressor stations. The project also will include supply laterals and gathering lines connecting the system with gas producing fields in southern Louisiana.

The initial design delivery capacity of the system is approximately 375 MMcf per day. By the addition of 5 more compressor stations the company expects ultimately to increase this to 565 MMcf daily.

Mississippi River Fuel Denied Proposal to Sell Gas for Boiler Fuel

The Commission has denied an application by Mississippi River Fuel Corp. to construct pipeline facilities to supply natural gas on an interruptible basis to Union Electric Company of Missouri for use in firing steam-electric boilers.

The Commission's action reverses a decision filed by a Presiding Examiner last February, authorizing the proposal subject to certain conditions.

The use of natural gas for this plant was found to be less efficient than coal as a fuel, so that the resulting savings to Union Electric would be about half a cent per thousand cubic feet.

"We have repeatedly held that the use of natural gas as boiler fuel is an inferior usage and that, while it is not to be denied in all situations, it should be permitted only on a positive showing that it is required by public convenience and necessity," the Commission asserted. Then it noted that Laclede Gas Light Co. which serves the St. Louis area and is Mississippi's largest customer, is unable to meet the demands of its customers for usages which are generally superior to those proposed in this proceeding, and that Mississippi cannot supply these unsatisfied demands because of capacity limitations.

Arkansas Louisiana Denied Proposal to Sell Gas for Electric Generation

The Commission has denied a certificate to Arkansas Louisiana Gas Co., for the construction of 6 miles of 12¾ inch lateral line to make available additional natural gas to a generating station of Arkansas Power & Light Co., Ark. This line, estimated to cost $205,646, was to parallel an existing line extending to the generating plant.

The proposed line was designed to serve an additional 30 MMcf daily for the plant. The Commission said that the evidence of record "does not show that available connected reserves when contrasted against volumetric requirements of consumers served from Applicant's presently existing pipe-line system are sufficient to meet those loads for a reasonable period of years." The Commission added that it would be contrary to the public interest to permit the attachment of 30 MMcf of additional daily power plant load.

Northern Natural to Supply Gas to Fertilizer Plant

Northern Natural Gas Company has been authorized to construct pipeline facilities to supply natural gas on an interruptible basis to the Nitrogen division of Allied Chemical and Dye Corp. for use in the production of fertilizer products.

The Commission denied the second part of Northern's application, proposing to build additional facilities to deliver and sell the gas to Allied on a firm basis.

American Gas Fundamentals OUTLINE

NATURAL GAS
- *Geology
- *Drilling and completion
- *Methods of estimating reserves
- *Chemicals from gas
- *Natural Gas Conservation

MANUFACTURED GASES
- *Coke oven gas; producer gas, blue gas; carbureted water gas
- *Reformed gas
- *Hi-Btu oil gas
- Interchangeability

LIQUEFIED PETROLEUM GASES
- *Sources, properties and uses

BASIC GAS LAWS
- *Perfect gases
- Supercompressibility

TRANSMISSION
- *Pipe lines
- *Corrosion and pipe protection
- *Compressor stations
- *Gas conditioning
- Flow formulae
- *Principles of orifice measurement
- Pipe coatings and protection methods

GAS STORAGE
- *Methods of storing gas

GAS DISTRIBUTION
- *System design and operation
- *Pressure regulation, part 1
- *Pressure regulation, part 2
- *Leak detection and control
- *Metering
- Measurement and accounting
- *Odorization
- Customer service

GAS UTILIZATION
- *Principles of gas combustion
- Competitive fuels
- Domestic
- Commercial
- Industrial
- *Principles of absorption refrigeration

CONVERSION PRACTICES

MANAGEMENT PROBLEMS AND POLICIES
- *Corporate structure
- *Public utility regulation
- *Public relations
- Theories of rate making
- Rights-of-way

GLOSSARY
- *Ab-to-Ex

***Indicates chapters published since January 1, 1951; available without charge to new subscribers to American Gas Journal.**

How to Use the Material

American Gas Fundamentals *is a comprehensive compilation of basic gas facts to guide any gas utility employee toward a broader understanding of the industry as a whole.*

The series is designed to be removed from each current issue of AMERICAN GAS JOURNAL *and filed in a ring binder where it may be accumulated into a text book of permanent usefulness. Material should be filed under the major subject head appearing in the upper right hand box at the head of each chapter.*

The Competitive Fuels—Part 1

THE wealth of the United States is directly related to our supply and utilization of fuels. Productive capacity of this country has increased substantially since 1900, and in 1951 we used about five times more energy from fuels than we did in 1900. This country uses tremendous quantities of fuels to furnish necessary energy for transportation, domestic and commercial space heating, and industrial heat and power.

Basic sources of energy are coal, petroleum, natural gas, wood, water power, geothermal energy, solar radiation, wind power, and nuclear energy. These sources of energy when divided or transformed provide us with such *solid* fuels as bituminous coal and lignite, anthracite, coal coke, petroleum coke, briquets and packaged fuel, and wood; such *liquid* fuels as gasoline, diesel fuel, kerosene and range oils, distillate fuel oils, residual fuel oils, and coal tars; such *gaseous* fuels as natural gas, manufactured gas, mixed gas, and liquefied petroleum gas; and *electrical energy*.

Gasoline, diesel fuel and coal used in transportation can not be replaced or interchanged with gaseous fuels, except in a few installations, therefore, this fuel utilization will not be used in comparing the competitive fuels. In this chapter, *competitive fuels* are those which can be replaced or interchanged with the gaseous fuels in any utilization—non-fuel uses are excluded. Competition between some of the fuels being considered does not exist due to inherent characteristics of some fuel burning equipment and lack of fuels in certain areas. This chapter will consider production, reserves, consumption, thermal efficiencies, comparative costs, and future trends of competitive fuels used for domestic and commercial space heating, and industrial heat and power.

Quantities of solid, liquid, gaseous and miscellaneous fuels are expressed in such unlike units as tons, barrels, gallons, cubic feet, cords, and kilowatt-hours. The figures used to compare competitive fuels will be expressed in British thermal units (Btu), or the larger value therm (100,000 Btu), since the Btu is a common denominator for unlike values of volume and weight units. Table 1 shows thermal conversion factors used for this comparison of competitive fuels.

Energy Production of Competitive Fuels

Thirty years ago, produced energy from coal was more than the combined production from crude oil, natural gas and water power. Now, the combined production from oil and gas is more than that from coal.

The United States produced, from these four energy sources, 167,732 million therms of energy in 1921; 184,120 million in 1931; 263,203 million in 1941; and 364,003 million in 1951.

These figures are lower than those reported by other sources, because no imports are included, and hydro-electricity is reported for public utilities only on an equal equivalent thermal basis.

Produced energy from each of the four major energy sources has increased during the 1921-1951 period. The percentage of total production contributed by coal has decreased in this period, and this amount has been supplanted by the other three energy sources. Coal contributed 78.7, 62.6, 56.6, and 41.4 per cent to our total production during 1921, 1931, 1941, and 1951 respectively; crude oil: 16.3, 26.8, 30.9, and 35.8 per cent; natural gas: 4.7, 10.1, 11.8, and 21.9 per cent; water power: 0.3, 0.5, 0.7, and 0.9 per cent.

Table 2 shows U. S. energy production of competitive fuels for 1941, 1946, and 1951. These years were chosen because they are representative of our changing economy, and reliable figures are available for a comparative basis. Energy from wood including mill wastes used only in domestic and commercial space heating is included in Table 2, to give a more complete analysis, however, disregarding this quantity the produced energy of competitive fuels is nearly 83 per cent of the U. S. total energy production.

The same general trends experienced in our total energy production are reflected in the production of competitive fuels during the 1941-1951 period. The percentages of total production for each solid fuel decreased except for petroleum coke, and increased for all the liquid and gaseous fuels and water power, with the greatest increase being noted for the gaseous fuels. Solid fuels on a competitive basis in 1951 produced 51.8 per cent of the total,

Table 1

THERMAL CONVERSION FACTORS FOR COMPETITIVE FUELS

	Btu
Solid Fuels	
Bituminous coal and lignite	26,200,000 /net T
Anthracite (Pennsylvania)	25,400,000 /net T
Coal coke	26,000,000 /net T
Petroleum coke	30,120,000 /net T
Briquets and packaged fuels	23,000,000 /net T
Wood including mill wastes	20,960,000 /cord
Liquid Fuels	
Crude oil	5,800,000 /bbl
Kerosene and range oils	5,691,000 /bbl
Distillate fuel oils (Grades 1-4)	5,824,980 /bbl
Residual fuel oils (Grades 5-6)	6,322,260 /bbl
Coal tars	6,300,000 /bbl
Gaseous Fuels	
Natural gas, wet	1,075 /cu ft
Natural gas, dry	1,050 /cu ft
Manufactured gas	550 /cu ft
Liquefied petroleum gas	95,500 /gal
Miscellaneous Fuels	
Electrical energy	3,412 /kwhr

liquid fuels 20.9 per cent, gaseous fuels 26.2 per cent, and water power 1.1 per cent.

Recoverable Energy Reserves of Competitive Fuels

What are the future supplies of competitive fuels? A complete answer to this question would require the use of data that are not available. A partial answer to this question is given in Table 3, which lists the recoverable energy reserves on December 31, 1951. Yearly published fuel reserve figures are not conclusive, and should be used only to predict future trends.

The oil and gas producing industry does not block out reserves that would last for long periods of time, and over the past these supplies have kept fairly constant. In 1952 our petroleum and natural gas reserves reached new all-time peaks, and the industry added to known underground stocks despite record high production levels.

Each year, fluid-fuel reserves are adjusted by extensions of previously discovered fields, revisions made on reserves in older operating fields, and new fields discovered by exploration. Large quantities of fluid fuels have been added to our reserves by the application of new methods of exploration and production. Imports, not considered in this chapter, have also extended our future supplies of fuels. The oil and gas industry must spend large sums of money to maintain reserves, and economic incentive will determine the future availability of these convenient fuels. This country will have adequate fuel supplies for many years to come. Future trends indicate that petroleum will be our first major fuel in short supply, followed closely by natural gas, and in the remote future by oil shale and coal.

Tremendous coal reserves (223,057,880 million therms), shown in Table 3, make all other competitive fuel reserves appear insignificant. Reserves of liquid fuels and petroleum coke in Table 3 have been calculated from the 1951 crude oil reserves and average production yields. Therms per capita, based on the 1951 population, have been included in Table 3 as a matter of interest, and this table indicates that there were about 1.5 million therms available at that time per capita.

Energy Consumption of Competitive Fuels

During 1941 the U. S. consumed 162,476 million therms of energy for both domestic and commercial space heating, and industrial heat and power, while in 1951 there were consumed 235,337 million therms, an increase of 44.8 per cent in this period. The fuels used for domestic and commercial space heating decreased from 43.5 to 38.9 per cent of the total consumed, when comparing the years 1941 and 1951, due to increased use of fuels for industry.

Fourteen different types of fuels are used by the U. S. for domestic and commercial space heating. Natural gas, bituminous coal, distillate fuel oils, wood, and anthracite, in order of their decreasing utilization, constituted 78.2 per cent of the fuels used for this purpose. The consumption of solid fuels for this purpose decreased 26.8 per cent from 1941 to 1951, while liquid fuels increased 9.6 per cent, gaseous fuels increased 15.3 per cent, and electrical energy increased 1.9 per cent.

The consumption of competitive fuels for domestic and commercial space heating is shown in Table 4.

Construction of large pipeline systems carrying gas

Table 2

U. S. ENERGY PRODUCTION OF COMPETITIVE FUELS[1]

	MILLIONS OF THERMS			PER CENT OF TOTAL PRODUCTION		
	1941	1946	1951	1941	1946	1951
Solid Fuels						
Bituminous coal and lignite	134,707	139,888	140,017	58.8	53.0	44.8
Anthracite (Pennsylvania)	14,318	15,369	10,838	6.3	5.8	3.5
Petroleum coke	497	640	1,143	0.2	0.2	0.4
Wood including mill wastes[2]	10,165	10,165	9,744	4.4	3.9	3.1
Total	159,687	166,062	161,742	69.7	62.9	51.8
Liquid Fuels						
Kerosene and range oils	4,131	5,941	7,725	1.8	2.3	2.5
Distillate fuel oils (Grades 1-4)	11,020	16,770	27,715	4.8	6.4	8.9
Residual fuel oils (Grades 5-6)	21,645	27,272	29,675	9.4	10.3	9.5
Total	36,796	49,983	65,115	16.0	19.0	20.9
Gaseous Fuels						
Natural gas[3]	30,387	43,607	77,868	13.3	16.5	24.9
Liquefied petroleum gas	442	1,628	4,037	0.2	0.6	1.3
Total	30,829	45,235	81,905	13.5	17.1	26.2
Miscellaneous Fuels						
Hydro-electricity[4]	1,737	2,676	3,405	0.8	1.0	1.1
U. S. Total	229,049	263,956	312,167	100.0	100.0	100.0

[1] Sources: U. S. Bureau of Mines; Federal Power Commission.

[2] Only that used in domestic and commercial space heating.

[3] Marketed production of dry gas on new basis.

[4] Includes that produced only by public utilities and converted on equal equivalent thermal basis.

from selected fields in the Southwest and Midwest to large markets in the Midwest, Appalachian and Pacific areas has been a big factor in expanding natural gas utilization. Cleanliness, convenience and ease of temperature control have been more important factors in the selection of liquid and gaseous fuels for domestic and commercial space heating than the factor of cost. However, it is pointed out that in certain areas, particularly those close to producing fields, the use of natural gas is cheaper than any other fuel.

Selection of fuel for use in industrial heat and power is based on availability and cost, except in cases where fluid fuels are mandatory for precise temperature control. Bituminous coal and lignite, natural gas, residual fuel oils and electrical energy are the types of fuels used most widely for industrial heat and power.

Energy used for heat and power in all manufacturing, electric generation, collieries, petroleum refineries, and oil and gas field operations are included in this category. During the 1941-1951 period oil and gas have increased in use and solid fuels have declined. The changing use of fuels can be shown clearly in the field of electric power generation. In 1941 coal produced 3,200 million therms of electrical energy, oil 260 million therms, gas 410 million therms, and water power 1,737 million therms, while ten years later coal produced 6,319 million therms, oil 979 million therms, gas 1,931 million therms, and water power 3,405 million therms. Increase in electric power generation in the ten year period (1941-1951) amounted to 97.5 per cent by coal, 276.5 per cent by oil, 371 per cent by gas, and 96 per cent by water power.

Increased consumption of liquid and gaseous fuels for industrial heat and power has been brought about by: (1) cheaper fuels for some installations; (2) assurance of a dependable supply; and (3) a wider use of accurate temperature control in industry. Industrial heat and power consumption of competitive fuels is shown in Table 5.

[Note: Tables 5 and 6 will be included in the following chapter, *The Competitive Fuels—Part 2.*]

Table 3

U. S. RECOVERABLE ENERGY RESERVES OF COMPETITIVE FUELS[1]

December 31, 1951

	Millions of therms	Per cent of total reserves	Therms per capita[2]
Solid Fuels			
Bituminous coal and lignite	221,330,680	97.962	1,442,993
Anthracite (Pennsylvania)	1,727,200	0.764	11,261
Petroleum coke[3]	13,237	0.006	86
Total	223,071,117	98.732	1,454,340
Liquid Fuels			
Kerosene and range oils[3]	89,103	0.039	581
Distillate fuel oils (Grades 1-4)[3]	321,601	0.142	2,097
Residual fuel oils (Grades 5-6)[3]	343,847	0.152	2,242
Total	754,551	0.333	4,920
Gaseous Fuels			
Natural gas	2,035,026	0.902	13,268
Liquefied petroleum gas[4]	74,229	0.033	484
Total	2,109,255	0.935	13,752
U. S. Total	225,934,923	100.000	1,473,012

[1] Sources: Bituminous Coal Institute; American Petroleum Institute; American Gas Association. Includes only mineral fuels.

[2] Based on 1951 population of 153,383,000 exclusive of armed forces outside U. S.

[3] Based on crude oil reserves and 1951 average production yields.

[4] Based on natural gas liquid reserves and 1951 average production yield.

Thermal Efficiencies of Competitive Fuels

Holaday, *et al*,[1] have done excellent work in a study of thermal efficiencies for domestic and commercial space heating, transportation, and industrial heat and power. Material in this section is a review of this investigation exclusive of transportation.

Fuel efficiency is often disregarded when it is selected for a specific use, due to placing more importance on other factors, such as availability and convenience of use. Consideration must be given to fuel utilization efficiency when our demands for energy are ever increasing, if we are to conserve our national resources.

Thermal efficiency—defined as the ratio of net usable energy output arising from a fuel in a given application to total fuel energy input—has been used as a logical basis for comparing efficiencies. For space-heating and process-heating purposes, net useful energy output has been interpreted to be the difference in fuel energy input and usual stack, radiation, and ash losses. For power generation, usable power output of a plant divided by total fuel energy input is considered to be a satisfactory criterion of efficiency.

Thermal efficiencies for competitive fuels are shown in Table 6.

In any application efficiency varies widely with load conditions and type of equipment, whether it is hand fired, stoker fired, a new designed unit, or a conversion unit, and these have been given consideration in determining values in Table 6. These efficiencies are values for fuel utilization after delivery to the equipment, and *do not* account for the energy requirement for transporting the fuel to point of use, although this is an important factor in fixing ultimate efficiency of fuel utilization. Transportation cost may amount to a great part of the fuel cost, and should be given consideration when selecting the proper fuel for an installation.

Higher utilization efficiencies are obtained in application of fuels for domestic and commercial space heating than in industrial heat and power. Thermal efficiencies of domestic heating fuels in Table 6 are for full and average load operations, and these take into consideration automatic stoker and hand firing of coal, designed and conversion burner firing of oil and gas, and are weighted on the number of these units in operation.

[1] Holaday, W. M.; Albright, R. E.; Apjohn, T. L.; and Steffens, L. R.: Fuels—Their Present and Future Utilization, 29th Annual Meeting, A. P. I., Division of Refining, Chicago, Illinois, November 10, 1949.

Table 4

U. S. ENERGY CONSUMPTION OF COMPETITIVE FUELS FOR DOMESTIC AND COMMERCIAL SPACE HEATING[1]

	MILLIONS OF THERMS			PER CENT OF TOTAL CONSUMPTION		
	1941	1946	1951	1941	1946	1951
Solid Fuels						
Bituminous coal and lignite	25,535	26,349	20,050	36.2	33.7	21.9
Anthracite (Pennsylvania)	10,541	10,160	7,072	14.9	13.0	7.7
Coal coke	1,738	1,325	574	2.5	1.7	0.6
Petroleum coke	196	218	347	0.3	0.3	0.4
Briquets and packaged fuel	352	697	630	0.5	0.9	0.7
Wood including mill wastes	10,166	10,166	9,744	14.4	13.0	10.7
Total	48,528	48,915	38,417	68.8	62.6	42.0
Liquid Fuels						
Kerosene and range oils	2,624	3,447	5,853	3.7	4.4	6.4
Distillate fuel oils (Grades 1-4)	7,043	8,134	14,519	10.0	10.4	15.9
Residual fuel oils (Grades 5-6)	2,947	3,144	4,815	4.2	4.0	5.2
Total	12,614	14,725	25,187	17.9	18.8	27.5
Gaseous Fuels						
Natural gas	6,164	9,482	20,129	8.7	12.1	22.0
Manufactured gas	1,411	1,835	1,505	2.0	2.4	1.6
Mixed gas	719	1,009	1,264	1.0	1.3	1.4
Liquefied petroleum gas	211	724	2,069	0.3	0.9	2.3
Total	8,505	13,050	24,967	12.0	16.7	27.3
Miscellaneous Fuels						
Electrical energy	937	1,467	2,917	1.3	1.9	3.2
U. S. Total	70,584	78,157	91,488	100.0	100.0	100.0

[1] Sources: U. S. Bureau of Mines, Minerals Yearbooks, Information Circular 7657; American Gas Association, Gas Facts.

This work showed that the *best* thermal efficiencies obtained under full load operations for bituminous coal stokers were 75 per cent, anthracite stokers 80 per cent, designed oil units 88 per cent, and designed gas units 84 per cent; while *average* efficiencies under full load operations were 10 per cent lower for both bituminous and anthracite stokers, 13 per cent lower for designed oil units, and 4 per cent lower for designed gas units. *Average full load* thermal efficiencies for hand-fired coal units were 55-58 per cent, conversion oil units 67 per cent, and conversion gas units 72 per cent.

Domestic coal, gas, and oil units when operating under average load conditions show 2-5 per cent lower thermal efficiencies than when operating under full load. The low value noted for coal, a principal domestic fuel, is due primarily to the fact that coal is fired by hand, which results in over-firing and consequently high heat losses. Gas, because it is subject to better control than either coal or oil, shows the highest efficiency.

Utilization efficiencies are generally higher for commercial heating than they are for domestic heating. The higher efficiency for coal in commercial heating is due in part to use of automatic stoker equipment. Commercial heating plants designed specifically for oil as contrasted to many conversion units employed in domestic heating account for increase in efficiency in this utilization.

Decrease in thermal efficiencies of fuels for industrial heat and power is due primarily to two factors: (1) low conversion efficiency for production of electrical energy (about 23 per cent); and (2) low efficiency in many manufacturing operations, where heat is required at very high temperature levels. Although no great difference in efficiency of fuel utilization among primary fuels is apparent in specific manufacturing applications, a large variation does exist among different industries. For example, in the manufacture of brick and fire clay, only 2 to 5 per cent of total available energy may be utilized effectively, whereas, in certain segments of the cement industry as much as 50 per cent may be utilized, and still higher values are obtained in operations such as petroleum refining.

Low thermal efficiency of gas (39 per cent) in industrial heat and power results, in part, from consumption of about one-fourth of all gas directly in the field for drilling, process and compression requirements. Efficiencies in this case are about 29 per cent, as compared to efficiencies in heating applications of 50 to 80 per cent.

This chapter on Competitive Fuels—Part 1 was prepared by Oscar F. Spencer, Associate Professor, Petroleum and Natural Gas Extension, School of Mineral Industries, The Pennsylvania State College.

Bond Market Still in Doldrums

Better Days Believed Ahead

by John F. Falvey

Financial Editor

CONTINUED tightness of money has combined with heavier than anticipated corporate need for expansion funds to spell rough sledding for new bond issues during recent weeks.

John F. Falvey

In fact the going has been so bad that no less than four issues have been removed from the auction block during the past month because of unsatisfactory terms after bids were made by investment banking firms. In some other instances companies are lengthening their building programs so as to utilize cheaper short term loans, pending hoped-for improvement in the bond market.

New corporate financing to date, in 1953, has been paralleling the record high $9 billion annual rate of 1952; and present indications are that any early slackening of the pace will be due chiefly to inability of management to market new securities on the basis which it feels it can afford to pay.

As mentioned in these columns last month, short term money also is proving increasingly hard to obtain due to the relatively small amount of funds available for the purpose. With lenders now talking of the possibility of raising the interest rate on short term paper to 4% from the 3¼% level to which it had been lifted only recently, utility managements in early need of funds may be squeezed on costs whichever way they turn.

This is expected to hold true for only a comparatively few months, however, since stabilization of long-term interest rates and a more orderly market on which to float bonds seems to be in the making for the coming fall. The only uncertainty at the moment is the question of how and on what terms the Treasury Department will handle its huge maturity problem in September.

Funds are flowing into all lending institutions at a heavy pace. This is shown in the estimate of the Economic Adviser to the President that savings in the first quarter of 1953 amounted to 7.8% of disposal income of $245 billion, compared with savings of 7.1% of disposable income of $229 billion in the corresponding 1952 period. This represents a gain of $2,851 million in savings for the quarter, or 17.5%.

Depreciation accruals and retained profits of corporations, meanwhile, are ahead of a year ago and more money is becoming available from this source to finance additions and improvements to properties. Then, too, the pressure exerted by tax payments will ease in the second half-year, when only 20% of corporate taxes will be payable. This will be a far cry from the tax drain on corporate cash in the initial six months. Even though plant and equipment outlays this year are expected to stay at the 1952 level, a smaller amount of public financing for the purpose might be required in closing months this year.

Unless the Treasury decides to come to market at that time with an unusually attractive long-term issue, the bond market might very well reflect in better action the expected shift from a lenders' to a borrowers' market.

The market weakness in corporate bonds has been communicated to stocks. This probably can best be summed up in the words of one of the important investment firms which recently has gone on record as stating:

"We still do not favor a broad buying program of utility stocks at current market prices. The change in interest rates has altered the whole basic relative market pattern of the utilities. The present higher interest rates are probably here to stay—we do not look for a swing back to much cheaper money at this time. If this is true, then utility common stock yields should be considerably higher than they were one year or two years ago, and in many cases higher than they are now! Ordinarily a good utility equity paying out 75% of earnings should yield 2 to 2½ percentage points more than the bonds of the same company and at least 1% more than its preferred stock. With some new bond issues requiring 4½ to 4¼% and preferred stocks as much as 5¼%, it is obvious that utility common stocks should yield 6% or more, except where the present payout of earnings in dividends is low and a worthwhile dividend increase seems a good possibility within a year to 18 months."

This investment firm has plenty of company in its thinking along this line, and its reasoning adds one more problem in the marketing of natural gas industry

(Continued on page 33)

INDEX OF YIELDS : SELECTED UTILITIES STOCKS

	May 1953	Apr. 1953	Mar. 1953	Feb. 1953	Jan. 1953	Dec. 1952	Nov. 1952	Oct. 1952	Sept. 1952	Aug. 1952	July 1952	June 1952
Natural Gas Transmission Companies	4.34%	4.18%	4.04%	3.95%	4.04%	4.04%	4.14%	4.48%	4.44%	4.10%	4.01%	3.98%
Natural Gas Transmission & Distribution Companies	5.28	5.06	4.91	4.91	5.02	4.99	5.14	5.47	5.45	5.30	5.26	5.28
Manufactured & Mixed Gas Companies	4.80	4.73	4.63	4.65	4.87	4.83	5.00	5.04	4.80	4.70	4.89	4.84
Class "A" Electric Companies	5.18	5.14	4.97	5.05	5.08	5.10	5.20	5.40	5.39	5.40	5.49	5.60
Class "B" Electric Companies	5.35	5.06	4.93	5.08	5.19	5.08	5.19	5.47	5.42	5.46	5.51	5.55

This is a straight arithmetical index of comparative yields obtainable on a selected group of gas and electric utility industry common stocks.

The companies comprising this index have been selected by the AMERICAN GAS JOURNAL as providing a representative cross-section of each industry, from the standpoint of geographical diversification and of the relative importance of the individual companies in their areas.

No effort has been made to weight the average to give effect to changes in capitalization or in dividend rates because the yields afforded on the issues reflect such changes. The index is designed to show the rate of return and not necessarily market movements on the stocks comprising it.

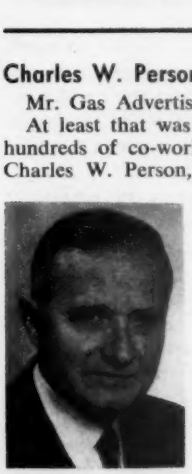
This index is compiled from: natural gas transmission companies, 5; natural gas transmission and distribution companies, 5; manufactured and mixed gas companies, 4; class "A" electric companies, 4; class "B" electric companies, 5.

News of the Gas Industry

Charles W. Person Retires from AGA

Mr. Gas Advertising retired on June 1.

At least that was the way it seemed to hundreds of co-workers and associates of Charles W. Person, who closed a distinguished career on that date. For as first secretary of American Gas Association's publicity and advertising section in November, 1919, six months after formation of AGA, he had given national coherence, and teamwork to the industry's communication system. Further, he was instrumental in the formation and growth of Public Utilities Advertising Association. And again, he was in a key position when the industry joined forces seventeen years ago to launch the first national cooperative program promoting domestic gas uses.



Charles W. Person

This citation is presented to Charles W. Person

Because of his outstanding contributions to the field of public utility advertising;

Because of his participation in the founding of the Public Utilities Advertising Association;

Because of his support of their Association for more than 30 years;

Because of his devotion to the development of high standards of advertising for the American Gas Association;

And particularly for his vigorous endeavors to promote fair play and ethical practices in advertising.

With Mr. Person providing the staff work and continuity behind the committees who directed this program over the years, it gained stature throughout the advertising and business world. Other industries who came to know of this program, also knew him as the man who coordinated the activities of agencies, committees and companies within the industry.

But what is more important, the national advertising program he held together so well coincided and, many believe, accelerated the "golden age" of gas. It reversed a downward trend and sparked an advance to all-time peaks.

It was also Charles Person, who fought continuously and effectively to raise the standards of advertising. A forthright tribute to this endeavor, as well as to his other contributions to the advertising profession, was the citation he received at the annual convention of Public Utilities Advertising Association, St. Louis, May 8.

At the same meeting, Mr. Person received a modern desk clock from his friends in PUAA. The presentation was made by C. Fred Westin, Public Service Electric & Gas Co., member of domestic copy committee, and first vice president of PUAA.

Mr. Person was born in Nebraska, and spent nineteen years in Denver, Colorado. After one year at the University of Colorado, he entered Columbia University and was graduated in 1912 with a B.S. degree.

Following graduation, he became a reporter for the New York Sun and served abroad in the first World War. On November 24, 1919, six months after American Gas Association had been formed, he became the first secretary of its newly organized publicity and advertising section.

Except for a four-year interval during which he spent one year with Koppers Co., Pittsburgh, and the remainder producing employee educational courses for National Electric Light Association, Consolidated Edison Co., New York, and AGA, he has been a member of the AGA headquarters staff engaged in advertising and publicity.

As director of advertising he has been secretary for seventeen years of national advertising committee and domestic and industrial & commercial gas copy committees. He helped organize Public Utilities Advertising Association in 1922, and was a member of its first directorate.

During his long career with the AGA, he has served under the administrations of 27 presidents and three managing directors, Oscar H. Fogg, Alexander Forward and H. Carl Wolf.

Plymouth-New Bedford to Merge

Ralph M. Miller, executive vice president, New Bedford Gas and Edison Light Co., and Martin H. Golden, general manager of Plymouth County Electric Co., and Plymouth Gas Light Co., have announced plans for the merger of Plymouth Gas Light Co. with the New Bedford Co. The petition now filed with the Department of Public Utilities, if approved, will be advantageous to both properties, economies will be effected and the merger will be in the public interest, they have reported.

The combining of sales and operational forces, coupled with a centralized administration and larger technical staff, would supplement the present Plymouth organization, and operate more economically because of the elimination of separate corporate records and accounts, it was said.

With the merger in effect, New Bedford will be able to utilize its production facilities upon the arrival of natural gas, to reduce peak demands for the Plymouth territory under its contract for the purchase of natural gas. This will eliminate the use of the more expensive propane gas at Plymouth during times of peak consumption, although it is planned to retain the propane installation in Plymouth for stand-by and emergency purposes.

Kuykendall Sworn in FPC Chairman

Jerome K. Kuykendall of Olympia, Wash., has been confirmed by unanimous consent of the Senate as a member of the Federal Power Commission for the remainder of the term ending June 22, 1957. On May 15 he was named by President Eisenhower to be chairman of FPC, and on that day he took the oath of office, replacing Thomas C. Buchanan.

Mr. Kuykendall, nominated by President Eisenhower, appeared before members of the Senate Committee on Interstate and Foreign Commerce in April. Following the hearing, the committee unanimously voted to recommend confirmation of his nomination.

A native of Pomeroy, Wash., Mr. Kuykendall served as a member of the Washington State Public Service Commission and as an Assistant State Attorney General.

New Plant for Autogas Company

Construction is underway in Bellwood, Ill., of a new 44,000 sq. ft. building for the Autogas Co., Chicago, manufacturers

of Republic gas appliances. The modern, one-floor structure will house production and shipping facilities, sales and advertising departments, and laboratory.

Occupancy is expected to take place in August or September of this year and it is possible that large-scale production of the Republic gas appliance line will begin shortly thereafter.

Tetco to Separate Prod Corp

Texas Eastern Transmission Corp. plans to separate its production subsidiary, Texas Eastern Production Corp., Houston, from the parent company, it has been reported.

Recently, the subsidiary purchased the West Hampshire gas field, containing estimated reserves of 120 billion cubic feet, Jefferson County, Tex., for $9 million and has made plans to issue about $20 million worth of stock to finance an expansion program, company officials have announced.

Industry Improves Safety Record

During 1952, the gas utility industry reduced both the frequency and severity of its accidents, American Gas Association reports. The industry had 14.40 disabling injuries to employees per million man-hours worked, an improvement of 8.4% from the frequency record of 1951. This marked the fifth successive yearly decline.

The severity rate, measuring days lost because of injuries per thousand hours worked, was 0.81 during 1952, or 22.1% better than the previous year. It was the third best record in this category in the past 20 years.

Reports on employee accidents are compiled annually by the AGA Bureau of Statistics for use of gas companies in analyzing their own performances, and for inclusion with other industry data developed by the National Safety Council.

Scott-Newcomb Co is Purchased

The Scott-Newcomb Co., St. Louis, Mo., has been purchased by the Barber Gas Burner Co. of Cleveland, O., D. E. Atkin, president, has announced.

Acquisition of Scott-Newcomb, manufacturers of oil, gas, and combination burners, would broaden the scope of the present Barber burner line, W. Hayden Thompson, vice president and general manager of Barber, has announced. Equipment, inventory, and physical assets of the purchased company were being moved from St. Louis to Cleveland, Mr. Hayden stated.

Sales policies and methods of distribution will conform with sales operations now in effect and will be handled by the Barber sales department.

Equitable Gas Co in X-Ray Drive

Equitable Gas Co., Pittsburgh, recently allotted space for an X-ray unit at its downtown Pittsburgh sales office, for the first mass chest X-ray survey in the City of Pittsburgh and Allegheny County. The survey was designed to discover unsuspected cases of tuberculosis and other chest disorders.

The space offered for the X-ray unit by Equitable enabled 7,438 persons in the area to have X-rays taken, during the period from March 25 to April 27.

The Survey, sponsored by The Pittsburgh and Allegheny County X-Ray Survey Foundation, required the efforts of local and welfare agencies in cooperation with the United States Public Health Service. Every person in Allegheny County 15 years of age and over was given the opportunity of receiving a free chest X-ray.

Rockwell to Open New Plant

Rockwell Manufacturing Co. will open a new valve and meter plant in Sulphur Springs, Tex., during the latter part of the year, Lloyd A. Dixon, Jr., vice president, meter and valve div., has announced.

The plant, now under construction, represents an investment of several million dollars, and will be devoted largely to production of Nordstrom valves.

The one-story brick and tile 125,000 sq ft building will be completely air conditioned, and except for office space, will be windowless, a design feature used to provide controlled conditions for performing close tolerance manufacturing operations. The factory is being established to serve the entire South and Southwest.

PAR Plan Completes Eighth Year

The PAR Plan, the gas industry's cooperative program of promotion, advertising and research sponsored by American Gas Association has completed its eighth successful year of operation, Norman B. Bertolette, president, The Hartford Gas Co., and 1952 chairman of the AGA PAR Committee, has announced.

Utility companies contributed $1,896,427 to the PAR Fund, and pipeline companies subscribed $90,066. Total subscriptions of $1,986,493 were the largest in the history of the plan, and were about 22% higher than in 1951. Cash on hand and income from temporary investments brought the total available for 1952 to $2,159,562. Total expenditure for the year was $1,891,516.

PROOF

HERE'S HOW TAPECOAT® HAS STOOD THE TEST OF TIME TO SOLVE CORROSION PROBLEMS

PROOF (Underground) — Inspection of TAPECOATED joints after 10 years of underground service showed no sign of corrosion when the TAPECOAT was removed.

PROOF (Alternate wetting and drying) — Expense and trouble in protecting lines subject to wet and dry conditions at cooling towers have been eliminated since 1944 by coating with TAPECOAT.

PROOF (Underwater)—During the re-laying of an underwater pipe line in the Gulf area, examination showed that TAPECOAT had protected the pipe against salt water corrosion and barnacles.

PROOF (Above ground)—A gas line at a bridge crossing was TAPECOAT-protected in 1944. There has been no need for attention and *no interruption of service* since the pipe was TAPECOATED.

Actual experiences like these show what TAPECOAT coal tar protection can do for you.

Use TAPECOAT to combat corrosion above or below ground on gathering lines, transmission lines, meter stations, compressor stations, distribution lines, pipe joints, bolt-type couplings, fittings, large bends, large diameter pipe, insulated lines, tanks, and other surfaces subject to corrosion.

Write for descriptive brochure and prices

The* TAPECOAT *Company

Originators of Coal Tar Tape Protection

1529 Lyons Street, Evanston, Illinois

WELCOME TO "TRANSMISSION"

With an advance copy of the first issue of Northern Natural Gas Company's newest publication, Transmission, before us, the editors of AMERICAN GAS JOURNAL are pleased to say, "Welcome to the gas industry publication field."

Our best wishes to: W. J. Quinlan, publications director; J. J. Finnegan, editor; Jack Dixon and Vern Dalton, associate editors of Transmission.

Mr. Quinlan has announced that the new magazine will be sent to utility customers, employees, newspapers, radio and TV stations, chambers of commerce, and others in Northern's system area.

Scully Returns to Norwalk Valve

Bill Scully, active for many years in the gas industry, has returned to his former position with Norwalk Valve Co. as sales manager.

Mr. Scully's experience in the industry extends from 1926 when he joined the headquarters of American Gas Association. Since that time he has been in both the utility and manufacturing field.

Burdett Mfg Appoints Sales Mgr

C. E. Fitzgerald, formerly sales engineer in Michigan and Ohio for Burdett Manufacturing Co., Chicago, has been appointed sales manager.

Gas Utility Service Policies Summarized in AGA Survey

(Continued from page 17)

local utility, adequate training of local personnel in appliance installation, adjustment and parts replacement, and further with the assistance of the local utility, to make field checks to determine the effectiveness of the training program. In such a training program, the installation information given to appliance installers should conform to local ordinances, building and plumbing codes, and other applicable regulations.

The customer was not forgotten by the committee; two points of good practice were included in the report for him:

APPLIANCE OPERATION It is the responsibility of the customer to operate the appliance in accordance with the manufacturer's instructions and with proper care.

NOTICE BY CUSTOMERS It is the responsibility of the customer to notify the selling agent promptly regarding parts replacement during the warranty period. It is the responsibility of the customer to notify the utility promptly of any abnormal condition of gas service or appliance operation.

The responses from gas utilities to the 400-question survey were reduced to statistics and summarized in 6 tables released by the committee at the Chicago conference.

CLEVELAND *Baby Diggers*

"The Gas Industry's Trenchers"

—for over 30 years

MORE TRENCH

- 4-Speed Main Transmission
- Wheel-Type—Fastest Digging Method
- 12-Speed Crawler Transmission
- Wider Range of Trench sizes
- Generously Powered

IN MORE PLACES

- Compact—Less Than 60" Wide
- Full-Crawler Mounting—Completely Maneuverable
- Fast Boom Hoist
- Shiftable Conveyor
- Truck-Speed Portability—Safer, *Faster* Job Moves

AT LESS COST

- *One* Machine for Mains *and* Services
- Digs All Soils in All Weathers
- Less Property Damage—Crawlers Save Lawns, Walks, etc.
- Unit-Type Construction
- Lower Maintenance Costs
- Longer Life

Get the full story on CLEVELANDS from your local distributor

THE CLEVELAND TRENCHER CO.

Pioneer of the Modern Trencher

20100 ST. CLAIR AVENUE • CLEVELAND 17, OHIO

"GET—AND KEEP—PUBLIC OPINION ON OUR SIDE"

"When one of us in any way antagonizes a customer or member of the public, our action is remembered. Forgotten is the fact that, for 365 days last year, that customer received a clean, cheap fuel, when he wanted it, where he wanted it, and in the desired quantity. These, the important things, are forgotten, while the minor things are remembered and resented.

F. M. Banks

"They are remembered when a company applies to a public service commission for a rate increase; they are remembered when a company wants a right-of-way to build a pipeline; they are remembered when a legislative body holds hearings on a bill which would restrict the company's activities.

"There are few things in this world more powerful than public opinion. With public opinion on your side, there is little that cannot be accomplished; without it, nothing can be done.

"It obviously behooves all of us, therefore, to get—and keep—public opinion on our side.

"The executives of our companies can plan and undertake public relations programs costing millions of dollars; yet these programs cannot be effective unless each of us carries out those programs as individuals. And our acts as individuals can most effectively cancel out the programs designed and executed by the skilled, accomplished professional.

"The fact is, each of us, in the mind of the public we serve, IS the gas company. And those of us who most come in contact with the public can do the greatest harm in creating an unfavorable impression in the public mind —or can be the most constructive in obtaining the public's good will.

"Whether based upon fact or fantasy, the ill will of the public must have a detrimental effect upon gas companies and upon our industry. And, ultimately, whatever affects our company, affects us as individuals. Therefore, it is necessary for every member of our industry, in his own self-interest, to avoid at all costs antagonizing the public and to take any and all action possible to secure its support and friendship.

"Those of us who come personally into contact with the public have a unique opportunity to spread the story of the gas industry; of its achievements; its services; its aspirations; of what it has done and what it is doing in the public's behalf. For only with public support can the gas industry progress and prosper. Clearly, it's up to us."

From an address by
F. M. Banks
Second vice president
American Gas Association
President and General Manager
Southern California Gas Co.
at AGA Transmission and Storage Conference

Alabama-Tennessee Nat Elects VP

Ralph K. Tallant, superintendent of operations, has been elected vice president in charge of operations of Alabama-Tennessee Natural Gas Co. Prior to 1951, when Mr. Tallant joined the company, he served with the Petroleum Administration for Defense.

He has been active in the natural gas industry since 1915 when he began work with Cities Service Co., Bartlesville, Okla.

Tom Walker New Transcon Pres

Tom P. Walker, vice president, Irving Trust Co., N. Y., has been elected president of Transcontinental Gas Pipe Line Corp., replacing Claude A. Williams who resigned, directors of the company have announced.

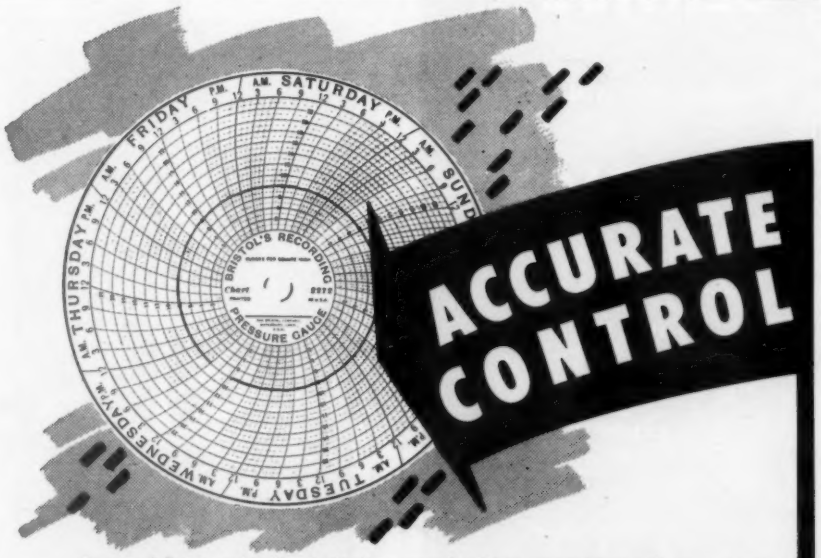
Bristol Co Names 2 Executives

Harry E. Beane has been appointed vice president of sales, The Bristol Co., Waterbury, Conn., according to an announcement by William H. Faeth, president.

Mr. Beane joined the company in 1920 and in 1925 was appointed district manager of the Birmingham, Ala., office. In 1943 he was made sales manager of the instrument division and in 1947 promoted to general sales manager.

The company has announced also, Sam E. Gewin has been appointed district sales manager, St. Louis office.

Mr. Gewin was associated with the U.S. Industrial Chemical Co. for 3 years before joining the Bristol sales organization in 1937 as sales engineer.



Reynolds Service Regulators are built to meet specific requirements — years of operation in the field through a complete range of operating conditions have proved not only their superiority but their durability. With parts so precisely machined for each model that they are completely interchangeable. The accuracy you require in performance is assured.

MODEL 10

Dead Weight or Spring Type, with or without Mercury Seal, or Dead Weight Safety Seal or diaphragm operated relief valve. All working parts are so accessible as to be interchangeable without removal from pipe line.

MODEL 20

Dead Weight or Spring Type, with or without Mercury Seal, or Dead Weight Safety Seal or diaphragm operated relief valve. All working parts are so accurate as to permit complete interchangeability in shop.

MODEL 30

For horizontal or vertical connections, with or without removable valve pocket. Available with either Spring or Dead Weight adjustment. With or without Mercury or Dead Weight Safety Seal or diaphragm operated relief valve.

Reynolds Gas Regulator Co.
ANDERSON, INDIANA, U. S. A.
GAS CONTROL SINCE 1892

A Complete
MAIN
TREATMENT
SERVICE

Prepare for Natural Gas

GPM PRODUCTS

"FLUSHALL"
– Dust Removal

"SOLVALL"
– Liquid Phase Gum

"SEALALL"
– Joint Sealing

"WETALL"
– Dust Laying

"FOGALL H"
– Hot Fogging

"FOGALL C"
– Cold Fogging

"IRON HYDROXIDE"
– Purification

Discuss your problems with our engineers

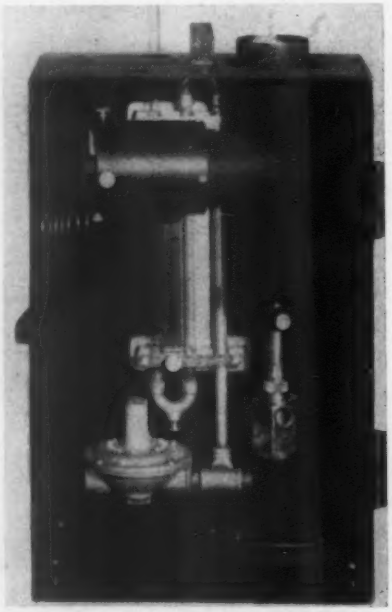
GAS PURIFYING MATERIALS CO.
3-15 26th Ave.,
Long Island City, N. Y.

New Unit Stabilizes Heating of Mixed Utility Gas

(Continued from page 15)

valve movement proportional to the deviation of the measured variable from the desired value and automatically compensates for load changes would give even closer control of this process.

The operation is not entirely automatic because a manual operation of burner adjustment is occasionally required. These changes are necessary only



Close-up of Caloroptic Btu controller showing sensing element and other components.

when there are major changes in the characteristics of the gas being made, such as when a different water gas machine is started at a different Btu level, or a very marked change occurs in the digester gas pumping rate.

Chart record astonishingly good

Referring to the actual unretouched chart record from the ElectroniK recorder-controller, note the excellent results obtained. Each of the major divisions on the 5-0-5 chart normally represents 10 Btu. (The 5-0-5 evenly-divided graduations are entirely relative and merely indicate deviations from the zero center control point.) The large swings of the pen from the zero control point are due to the lag in correcting the gas back to 700 after pumping rate changes. These lags would not materially affect gas to city as gas mixes in a huge storage holder before distribution.

A study of the two charts will show that approximately six times during the day wide swings in Btu occurred and, in each case, there was a marked pumping rate change. The biggest swing in Btu was shown as about 15 Btu; this happened at 8:00 a.m. and again at 1:45 p.m. when there was a change in pressure from 20-to-44" in the morning and in the afternoon from 48-to-24".

Conclusion

There are many significant facts and some truly remarkable results emanating from the Caloroptic installation.

To begin with, from a concrete dollars and cents standpoint, the Btu controller is a proven success. The system undoubtedly more than paid for itself in less than six months.

Secondly, the economics of the accuracy of the heating value are so important to one industrial concern that they take their own Btu checks twice daily. With a monthly usage of well over 30 MMcf, stray Btu represent money.

Economic advantages of the unique Connelly Btu control system are still secondary to the intangible benefits derived from improved customer-company and operator-company relations. In the final analysis, of course, customer satisfaction is the most important benefit.

And lastly, from an instrumentation and control standpoint, the Caloroptic control system performs an exceptional control job with equipment which has a relatively small initial cost when compared with elaborate systems.

STANDBY
for
NATURAL GAS

A packaged propane plant as designed, engineered and built by Draketown will provide a completely interchangeable fuel for your natural gas.

Ready in a matter of minutes, your Draketown Plant will click on automatically and take over all or part of your gas load. No delay—no appliance adjustments—no personnel problem.

During gas curtailment periods, "turn on" your Draketown Plant—you will find it pays dividends—it's good "Gas Insurance"!

*STANDBY
*PEAK SHAVING
*100% TOWN or PLANT SUPPLY

DRAKETOWN 9999 ®

Your Assurance of a Good Job
Serving Utility and Industry for over Thirty Years

DRAKE & TOWNSEND
INCORPORATED
Consulting • Design • Engineering • Construction
11 WEST 42ND STREET • NEW YORK 36, N. Y.

Bond Market Still in Doldrums

(Continued from page 27)

securities which have been burdened for some time by the uncertainties incident to regulatory lag in obtaining compensatory rate increases and to conjecture as to how much of additional rates put in effect under bond actually belong to the company.

An additional road-block of substantial dimensions from the standpoint of natural gas company stock offerings is the recent Circuit Court of Appeals decision in the Phillips Petroleum Company affirming the right of Federal Power Commission (against the Commission's wishes) to set the price on natural gas produced by Phillips and other oil company gas suppliers hitherto believed to be exempt from the Natural Gas Act.

Aside from these impediments to gas company equities, the news from the general stock market standpoint continues to be satisfactory. Earnings for all reporting corporations were 14% ahead of 1952 in the first quarter. And from latitude afforded by the favorable showing, company managements have been liberal in their dividend distributions. Disbursements to shareholders were up 5% in this first quarter and a comprehensive record of dividend action in April shows that fewer companies omitted or reduced dividends than in the identical 1952 month, while the number of increased disbursements was larger. Increases in payments in April this year were three times the number recorded in April 1952, affording strong evidence of sound financial condition and confidence of management in future earnings prospects.

Projection of the trend at the same rate for the balance of the year is expected to bring total 1953 payments to more than $9.5 billion.

A weak spot in the corporate financing picture is the small portion of new financing represented by equity shares. At last report bonds were continuing to account for four-fifths of all new offerings, a factor traceable chiefly to the tax advantage accruing to the borrower because of the tax-deductible nature of interest payments.

Convertible obligations are increasing in popularity. This type of security totaled nearly $1 billion in 1952 and the volume resorted to in the current year to date suggests that this figure will be duplicated in 1953.

While convertible obligations are 'neither fish nor fowl' in the opinion of a number of regulatory authorities, since they have neither the protection of a bond nor the earnings participation of common stock, they nevertheless do afford an interesting financing vehicle. The most recent natural gas company offering was made on a basis which anticipates conversion into common on a 5% dividend return. This is a better price than the company could have obtained for an equivalent offering made in common stock.

Until the market as a whole shows signs of further stabilization convertibles offer a medium which other natural gas company managements may have to adopt for financing of a goodly portion of such further financing as they must effect over early future months to take care of essential expansion.

NWAHACA Re-elects Phillips

The National Warm Air Heating and Air Conditioning Association re-elected C. B. Phillips as its first vice president at the recent annual meeting of the Association in Cincinnati.

Mr. Phillips, vice president in charge of sales, Surface Combustion Corp., has been active in the Association for many years.

Correction: March Issue

The article on Bacterial Attack on Buried Piping, by Carl G. Deuber, on page 23 of the March issue erroneously mentioned hydrogen sulfate in the caption at the bottom of the page. It should have read *hydrogen sulfide*.

1897 1953

PIPE STOPPERS OF ALL KINDS

•

SAFETY GAS MAIN STOPPER COMPANY

523 Atlantic Ave.,
Brooklyn 17, N. Y.
Cable Address: GASTOPPER, N. Y.

BAMAG

BAMAG

has supplied hundreds of installations for the gas industry all over the world

Consult GIDCO for BAMAG's processes and equipment:

- New improved Alkacid plants for recovery of hydrogen sulfide and carbon dioxide from industrial and natural gases
- New improved Claus plants for recovery of elemental sulfur
- Winkler and other types of generators for gas generation from coal
- Special Bamag tubular gas coolers
- Hydrogen sulfide scrubbing with active carbon
- Main equipment and accessories for gas utility companies
- Complete water purification and treatment installations

GENERAL INDUSTRIAL DEVELOPMENT CORP.

270 PARK AVE.
NEW YORK 17, N. Y.

BAMAG-MEGUIN
AKTIENGESELLSCHAFT

270 PARK AVE. • NEW YORK 17, N. Y.

AGA CONSERVATION WORK CITED BY MINES BUREAU

American Gas Association, at the natural gas transmission and storage conference, in Chicago during late-April, received one of the first awards given by United States Bureau of Mines to an organization or individual outside the Department of the Interior. The citation for outstanding and distinguished services to the department in conservation of natural resources was made by R. A. Cattell, chief, petroleum and natural gas branch.

The award was accepted by Frank C. Smith, president of AGA, and president, Houston Natural Gas Corp., at a conference session of about 400 delegates from natural gas transmission companies.

Mr. Cattell said the award was for services in work directed toward effective conservation of natural gas, raw materials for production of manufactured gas, steel and other vital resources. Although the award was for direct services during 1952, Mr. Cattell said to realize the full significance of the award, the work done over a long period of years should be considered.

Representatives of Bureau of Mines first met with AGA committees in 1920, when the association was only two years old. At the same time, Natural Gas Association of America, later merged with AGA, established cooperative work on the conservation of natural gas in Bartlesville, Okla. Since that time, AGA has shared in costs and in technical phases of many different projects designed to conserve natural gas and to inform the public about better methods of utilization.

Detroit-Michigan Stove Co Ups 3

Three promotions in the sales division of Detroit-Michigan Stove Co. have been announced. Paul Inskeep has been selected director of sales; Milton W. Elert has been named sales manager; and Jack Belanger has been made assistant sales manager.

Paul Inskeep

Milton W. Elert

Mr. Inskeep, who succeeds L. E. Clancy, resigned, as director of sales, has been associated with the company for the past fifteen years. He was sales manager for three years.

Mr. Elert, with the company sixteen years, previously was advertising manager and later assistant sales manager.

Mr. Belanger has been with the company for six years.

F. H. Finn Is Director, ConsNatGasCo

Fenton H. Finn, president, New York State Natural Gas Corporation, was elected a director of Consolidated Natural Gas Company, the parent company, at a March meeting of the board of directors.

John A. Laing

John A. Laing, general counsel of Portland Gas & Coke Co. and Pacific Power & Light Co., died at his summer home May 12, at 69 years of age. He became counsel for the Portland Co. in 1910 and held this position for 42 consecutive years. Mr. Laing was a director of the company from 1918 until the time of his death.

Wallace G. Murfit

Wallace G. Murfit, director of public relations of Philadelphia Gas Works, division of The United Gas Improvement Co., died at his home on March 31. Mr. Murfit was director of public relations and manager of district offices of PGW for 19 years.

William C. Royal

William C. Royal, Cleveland representative of Selas Corporation of America, died suddenly on April 10, at the age of 48. Mr. Royal had represented Selas for several years. Previously, he had been with a utility service company and with Citizens Gas Fuel Co., Adrian, Mich.

Carl P. Zimmerer

Carl P. Zimmerer, treasurer of Ebasco Services, Inc., died April 23, at the age of 63. Mr. Zimmerer became general auditor of Ebasco Services in 1935. Since December, 1945 he has served as treasurer of the organization.

M-SCOPE Pipe Finder

LIGHTWEIGHT MODEL

One Man Operation On Every Application

HIGHLY EFFICIENT

IMMEDIATE SHIPMENT

Free Demonstration and Operating Instructions

Catalog No. 25M On Request

JOSEPH G. POLLARD CO., INC.

Pipe Line Equipment

New Hyde Park New York

IRON SPONGE

for high efficiency gas purification at high pressures

Iron Sponge is your key to sulfur-free gas at minimum processing cost. Iron Sponge has high efficiency at low pressures or at today's high pressures and high temperatures. It absorbs *more* H_2S, gives long service between foulings, and is easily regenerated. Investigate it for your purification problem today!

CONNELLY Inc.

3154 S. California Ave., Chicago 8, Illinois

Elizabeth, N. J. • Los Angeles, California

A. O. Smith Corp Announces New Sales Zones and Appointments

The appointment of F. S. Cornell as executive assistant to the president of A. O. Smith Corp. has been announced.

Mr. Cornell will continue his responsibility as manager of the Permaglas-Heating division, Kankakee, Ill. A four-man committee of department heads will administer the division operation under Mr. Cornell's direction, it was announced. The committee includes: R. S. Friend, works manager; W. W. Higgins, chief engineer; S. E. Wolkenheim, general sales manager of the division, and D. J. O'Connel, business administration.

Also, creation of two new zones at Indianapolis and Kansas City, Mo., as part of a realignment of the sales forces of the north central district, the Permaglas-Heating division, A. O. Smith Corp., has been announced by S. E. Wolkenheim.

R. J. Ulvestad shifts from manager, zone 1, Chicago office, to sales manager, central zone at Kansas City covering; Missouri, Kansas, Iowa, Nebraska, Colorado and Wyoming.

G. C. Spratt, former sales representative, zone 1, becomes zone sales manager at Indianapolis, covering; Indiana, Michigan, Western Kentucky and Western Tennessee.

G. G. Fohey of the Chicago office, will assume new duties as heating specialist in the North central district, operating from Chicago.

The current appointments in district sales follow the general assignment of departmental duties within the division in recent months at Kankakee headquarters.

The appointments are: R. J. Shepherd, sales manager, water heaters; he formerly was at Philadelphia as zone manager for the division, where he has been succeeded by H. N. Johnson; W. A. Dunn, sales manager, metropolitan zone, covering New York and New Jersey; J. S. Robinson, now manager of heating equipment sales in the division, formerly north central district heating products sales manager; D. D. Williams, formerly product supervisor, heating products division, is manager of commercial water heater sales.

Mr. Wolkenheim, who was manager of range and water heater sales at Hotpoint, Inc., before coming to A. O. Smith in 1949, moved up to general sales manager in 1952 from the post of marketing director.

Mr. Wolkenheim is assisted by C. E. Bullock as manager, marketing services, and Lee Zoeckler as sales engineer.

In other appointments recently made, D. A. LeRoy was named sales promotion manager and K. E. Lofgren advertising manager.

Houston Nat Transfers H. W. Carey

Hillard W. Carey, with Houston Natural Gas Corp. since 1943, the last four years in Corpus Christi, has been transferred to Houston as chief geologist for Houston Natural Gas Production Co., new wholly owned subsidiary of the gas utility.

Bklyn Union Gas Co Promotes 3

Following a recent meeting of the board of directors of Brooklyn Union Gas Co., H. H. Cuthrell, president, announced that Samuel Green has been elected to the office of vice president and chief engineer. At the same time it was announced that A. Dudley Harrison was elected an assistant vice president, and Herman K. Merker has been appointed operating engineer.

Samuel Green

A graduate of Brooklyn Polytechnic Institute, Mr. Green began working for the company in 1912. In April, 1948, he was named assistant chief engineer, and was made chief engineer in 1951. He has been active in various American Gas Association projects.

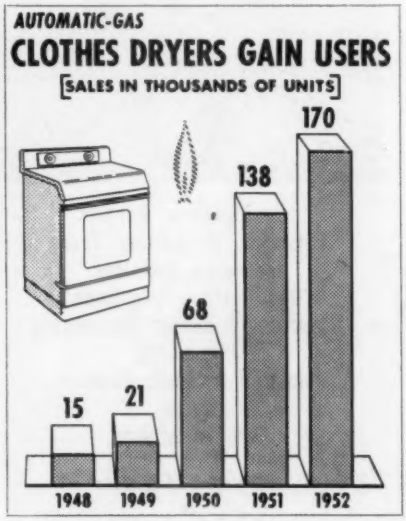
Mr. Harrison, a graduate of Stevens Institute of Technology, was promoted to assistant to chief engineer in 1950, and to assistant chief engineer in 1951. He started with the company in 1928.

In May, 1946, Mr. Merker was made assistant engineer of manufacture, and was appointed assistant to chief engineer in 1950. Graduated from the University of Illinois, he began as a general plant foreman for the company in 1928.

GAS DRYER SALES IN STEADY UPSWING

The automatic gas clothes dryer, one of the fastest-growing home appliances on the market, was sold in 1952 at a rate more than eleven times greater than in 1948, according to a recent announcement by American Gas Association.

Nearly one half million gas dryers, retailing at $125 million, are now in use in the United States, the AGA bureau of statistics reports. This popularity is attributed to the appliance's work-saving features, economy of operation and ability to dry clothes regardless of weather.



The accompanying chart, prepared by AGA, shows that the 170,000 units sold in 1952 represent an increase of 23% over the 138,000 units sold in 1951, and a 1,033% increase over the 15,000 units sold in 1948.

Indications of a continuation of the trend were foreseen in the vigor of the manufacturers represented in the dryer division at the Gas Appliance Manufacturers meeting at White Sulphur Springs, W. Va., May 20-22.

LOWEST COST PIPE INSTALLATION...
Send COUPON Today!
Hydrauger Corp., Ltd.
681 Market St., San Francisco, Calif.
Please send, without obligation to me, the HYDRAUGER BOOKLET which shows relative costs and speeds of BORING as well as specifications of various Hydrauger models.
NAME
ADDRESS
CITY
STATE
2" to 24" BORES - Up to 250' long.
HYDRAUGER
Reg. U. S. Pat. Office
OPEN HOLE
UNDER STREETS
UNDER FREEWAYS
UNDER GARDENS
UNDER PAVEMENT
HY-25A
AVOIDS EXCESSIVE TRENCHING
Hydrauger bored holes for pipe installation invariably reduce costs 80% to 90% by eliminating trenching and back-filling to say nothing of man-hour labor savings and safety to highway traffic.
HYDRAUGER CORP. Ltd.
681 Market Street
San Francisco, California
*Earth Boring Tool

D. B. Otto is Pres of NJ Nat Gas

Dale B. Otto has been elected president and director of New Jersey Natural Gas Co., James S. Abrams, Jr., chairman of the board, has announced. Mr. Otto was formerly vice president and general manager of County Gas Co., Atlantic Highlands, N. J. which bought the gas division of Jersey Central Power & Light Co. in June, 1952 and formed the present New Jersey Natural Gas Co.

Dale B. Otto

Also, elected as new members of the board were Alfred Lee Loomis, and James J. Mitchell, Jr. Re-elected to the board were: Henry Anderson, Frank Blaisdell, William Boland, Kenneth Knoblock, Irving Koerner, William L. Maude, Herbert P. McCabe, and James S. Abrams, Jr.

M-WGA Elects 1953-54 Officers

Highlights of the 48 annual meeting and convention of Mid-West Gas Association, held recently at Colorado Springs, Colo., included: the president's address by Amos H. Abbot, retiring president; a message from American Gas Association by Frank C. Smith, AGA president, and presentations by Robert Hendee, president, International Gas Association, and James F. Donnelly, president, Gas Appliance Manufacturer's Association.

The officers of Mid-West Gas Association, elected for 1953-54, are: president, E. E. Baxter, General Electric & Gas Co., Lincoln, Nebr.; 1st vice president, M. B. Cunningham, Iowa Power & Light Co., Des Moines; 2nd vice president, M. K. Wrench, Metropolitan Utilities District, Omaha, Nebr.; and secretary-treasurer, H. E. Peckham, Northern States Power Co., St. Paul, Minn.

MEN AT WORK

HAROLD L. BROWN has been assigned to New York regional office, sales force, *Sharples Chemicals Inc.*

WILLIAM D. BUCHANAN is now superintendent, eastern district, *New York State Natural Gas Corp.*

THOMAS D. CARTLEDGE has been elected vice president, *Union Carbide and Carbon Corp.*

ROBERT S. COOPER has been appointed superintendent of pipelines and compressor stations, *Wilcox Trend Gathering System, Inc.*

GEORGE A. CUNNINGHAM has been named assistant manager of gas products sales, Pittsburgh, *Rockwell Manufacturing Co.*

CHARLES W. DAVIS is now plant superintendent, *Peoples Water and Gas Co.*

CLARENCE EVANS was promoted to shop superintendent, day shift, Grove City, *The Cooper-Bessemer Corp.*

GUY GAHAGAN has been promoted to general superintendent, Grove City, *The Cooper-Bessemer Corp.*

JAMES HEINLEN has been assigned to Cincinnati area as service engineer, Wheelco instruments division, *Barber-Colman Co.*

JAMES J. HOFFMAN, JR., has been made service engineer, Cleveland, Wheelco instruments division, *Barber-Colman Co.*

CARL E. HOUGHTON has been appointed superintendent, communications department, Pittsburgh, *The Peoples Natural Gas Co.*

VERNON N. JENNINGS has been named service engineer, Tulsa, Wheelco instruments division, *Barber-Colman Co.*

ROBERT M. JOHNSON has been appointed Southern California sales manager, *General Controls Co.*

O. L. LIEPIN is now branch manager, Philadelphia office, *General Controls Co.*

ALBERT G. LINDSAY has been named manager, export and international divisions, *Rockwell Manufacturing Co.*

EUGENE R. LOPEZ was appointed vice president, *Chemical Fire and Rust Proofing Corp.*

WILLARD LULI has been named works manager, Grove City, *The Cooper-Bessemer Corp.*

KEN MARTIN was appointed production manager, Grove City, *The Cooper-Bessemer Corp.*

JOHN MCGOWAN was appointed to the sales staff, New York office, *Scaife Company.*

TOM MCMICHAN has been appointed special assistant to the president, *The Cooper-Bessemer Corp.*

ALLERTON MILLER has been named vice president, *Texas Gas Transmission Corp.*

R. G. MYERS was appointed southwestern district manager, *Davey Compressor Co.*

D. J. PARKER is now service engineer, Omaha, Wheelco instruments division, *Barber-Colman Co.*

NORMAN P. PHILLIPS was assigned to Midwestern regional office, sales force, *Sharples Chemicals Inc.*

LEONARD SCHNALL heads a new field sales and service office, Syracuse, *General Controls Co.*

FRANK STEVENSON was appointed special assistant to the president, *The Cooper-Bessemer Corp.*

HUGH STEVENSON is now assistant works manager, Grove City, *The Cooper-Bessemer Corp.*

RICHARD L. STONE is now research engineer, Belmont, Cal., *William Wallace Co.*

EVERETT O. STOOTHOFF has been promoted to secretary, *Texas Gas Transmission Corp.*

RICHARD S. VAN NOTE was appointed manager, Chicago office, *Selas Corporation of America.*

DONALD C. WATERMAN has been assigned to New York regional sales office, *Sharples Chemicals Inc.*

S. F. WIKSTROM, JR., is now promotional representative for the Southern territory, *American Gas Association.*

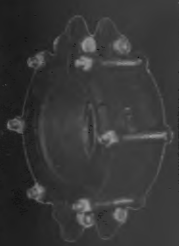
RICHARD N. WILLIAMS was assigned to Chicago regional sales office, *Sharples Chemicals Inc.*

FOR REPAIRING BELL AND SPIGOT JOINT LEAKS...

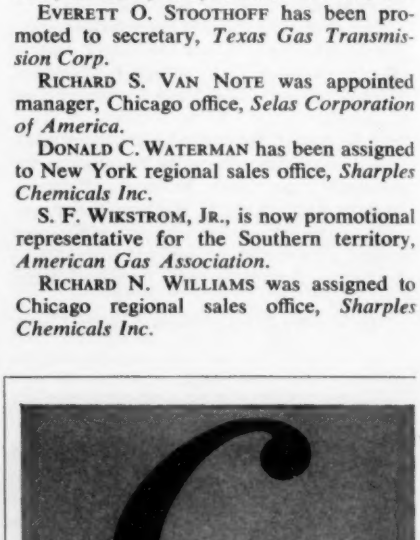
SKINNER-SEAL Bell Joint Clamp for stopping bell and spigot joint leaks under pressure. Gasket is completely sealed: at bell face by Monel Metal Seal band — at spigot by hard vulcanized gasket tip. 2" to 42".

AND BROKEN MAINS

SKINNER-SEAL Split Coupling Clamp. One man can install in 5 to 15 minutes. Gasket sealed by Monel band. Tested to 800 lbs. line pressure. A lasting repair. 2" to 24" incl.



M. B. SKINNER CO.
SOUTH BEND 21, INDIANA, U.S.A.



Investigations, Reports
Financing, Accounting, Taxes
Insurance, Pensions
Depreciation, Valuations
Consulting & Design Engineering
Purchasing
Industrial & Public Relations
Rates
Gas Conversions

42 years of service

Send for booklet

COMMONWEALTH SERVICES, INC.
20 PINE ST., NEW YORK 5
WASHINGTON, D. C. JACKSON, MICH.

Concentric Catalytic Generator Design Improved

(Continued from page 21)

therefore the heat input for heating to the reforming temperature is higher than in the partial reaction with air.

Because of the long contact time and reduced velocity in the preheating sections, higher hydrocarbons will decompose into hydrocarbons with lower carbon content, without the presence of the catalyst. The propane, propylene, butane will change to mostly ethane before entering the catalyst mass. This is a special feature of the concentric catalytic generator. Because of this and the longer contact-time, a lower temperature and less heat will be required in the catalyst mass, allowing the reduction of the combustion chamber temperature and flue gas losses.

Radiation losses are reduced with lower temperatures in the combustion chamber. Refractories and insulation are increased.

Expansion provisions

The entire body of the concentric catalytic generator, supported at bottom, can expand freely at the top. Each of the inside cylinders can expand freely; those that are welded at the bottom expand at the top; those welded at the top expand at the bottom.

The top and bottom horizontal rings on which the outside shell is welded may produce expansion stresses in the metal. A new provision, with joints at top and bottom of the outside shell, will allow free expansion, horizontally, in the top and bottom rings; also, it allows for vertical expansion of the shell.

The weight of the upper parts is supported by the second cylinder instead of the first shell as before and openings at the top of the second cylinder will allow passage of gas mixture.

This disposition permits reduction in thickness of the first shell and the supporting by the second cylinder where lower temperatures and lack of corrosion will promote longer unit life.

Catalyst charging and discharging

The catalyst mass can be regulated by charging and discharging without dismantling the unit. There is a free space above the catalyst for preheating feed mixtures. The height and the free surface, where heat transmission is better than in parts containing catalyst, can be regulated by the height and volume of catalyst mass. The possibility of varying this height allows variation, if desired, in the preheating of feed mixture.

The catalyst mass can be charged from filler tubes at top and discharged by a system supporting the catalyst at the bottom. This system has been revised so that supporting plates can be moved from outside by a linkage system.

The quenching system

The quenching system for rapid cooling of reformed gas immediately at the outlet of the catalyst mass has been revised. Instead of a spraying system inside the decanter, sprays are in the outside shell, allowing external dismantling and revision.

Controls have been provided for automatic proportioning of feeds in the mixture, automatic heat regulation to limit combustion chamber temperatures to the maximum. Safety devices for automatic shut-off have been provided for drops in pressure of steam, air, feed or for power interruptions.

Recuperation of flue gas heat produces steam and also superheats the steam to temperatures which will preheat the feed and air in a mixer-heater. This reduces the required input to the burners.

It is of interest in certain cases to use a cheaper fuel for heating of the generator.

Heating with heavy oil, containing sulphur, is avoided for the tubular-type generator, because of the corrosion on thin long tubes and the more difficult burner regulation and the longer flame of the heavy oil burners.

The concentric catalytic generator does not present the same risks and heating with heavy oil is allowable. Volumes of the combustion chambers for the different types of generators have been increased, in considering larger capacities and eventual heating with fuel oil.

Reforming efficiency is more than 100%, due to hydrogen liberated from water, adding to the heat value of the reformed gas. Even though the total thermal efficiency is lower, the heat content furnished for heating, for instance 20%, being at lower cost than propane, may lower the total fuel cost from the cost of propane-air, with 100% thermal efficiency.

Substitution with other gas

The possibility of selecting proportions between reactions with steam and air allows the production of a reformed gas with desired heat content and gravity, from 230 Btu/cf to 330 Btu/cf and from 0.38 to 0.62 gravity.

The reformed gas can be enriched with higher heat content gas, such as propane or natural gas, to obtain a gas with desired heat content and gravity.

The substitution can be 100% with manufactured gas of either 450 or 525 Btu/cf and from 0.45 to 0.65 gravity.

When propane-air is provided for reserve and for natural gas peak loads, the proportion which can be introduced in the gas is approximately 25%, as propane air of 1000 Btu/cf has 1.2 gravity and natural gas of 1,000 Btu/cf generally has 0.6 gravity. By reforming propane to a gas of approximately 300 Btu/cf and 0.38 gravity and enriching with propane to 1,000 Btu/cf, the gravity of the gas will be approximately 0.74 instead of 1.2, as for propane-air. It may be possible to increase substantially the proportion of propane in substituting natural gas for reserve and peak loads. The fuel cost may be lower than propane-air, as seen before.

When oil gas (1,000 Btu/cf, gravity 0.85) is available as substitute for natural gas, the reforming of part of the oil gas after purification can produce a gas of low gravity (0.38) and high hydrogen content (68%) which, mixed with higher heat content oil gas (1,150 Btu/cf), may produce a mixture with higher substituting proportions.

The introduction of hydrogen (for instance, 5% in the form of reformed gas) in natural gas may improve the usual combustion characteristics of natural gas and also obtain a lower contractual heat content (1,000 Btu/cf) for natural gas of higher heat content (1,050 Btu/cf, for instance).

The improvements in the concentric catalytic generator allow a simple, sturdy construction, at reduced capital investment, low maintenance cost and higher efficiency for the production of a gas with desired specifications in a continuous process at low operating cost.

CRUSE-KEMPER COMPANY

AMBLER, PENNA.

FIFTY YEARS OF SOUND

STEEL PLATE CONSTRUCTION

GAS HOLDERS **PURIFIERS**

Gas Holder Repairs **Gas Holder Inspection**

GAS INDUSTRY CALENDAR

June

14-18 Canadian Gas Association, Windsor Hotel, Montreal.

22-23 Michigan Gas Association, Grand Hotel, Mackinac Island.

July

13-17 Western summer radio-television and appliance market, Western Merchandise Mart, San Francisco.

13-17 National housewares & home appliance manufacturers exhibit, Auditorium, Atlantic City.

August

24-26 Appalachian gas measurement short course, West Virginia University, Morgantown, W. Va.

September

9-11 PCGA, San Francisco.

10-11 30th Mid-West Gas School and Conference, Iowa State College, Ames, Iowa.

11 New Jersey Gas Association, Spring Lake, N. J.

26 Southern Gas Association, transmission section, round table on rights-of-way problems, Tutwiler Hotel, Birmingham.

October

6-7 Texas Mid-Continent Oil & Gas Association, Rice Hotel, Houston.

7-9 National Association of Corrosion Engineers, South Central region, Mayo Hotel, Tulsa.

19-23 National metal exposition, Public Auditorium, Cleveland.

26 AGA Board of Directors, St. Louis.

26-28 AGA annual convention, Kiel Auditorium, St. Louis.

November

9-13 National Hotel Exposition, Kingsbridge Armory, New York.

11-13 Wisconsin Utilities Association, Hotel Schroeder, Milwaukee, Wis.

17-20 AGA operating section, organization meetings, Hotel New Yorker, New York.

29-December 4 The American Society of Mechanical Engineers, Statler Hotel, New York.

30-December 2 Southern Gas Association, advisory council and management conference, Grand Hotel, Point Clear, Ala.

March, 1954

25-26 New England Gas Association, Hotel Statler, Boston.

April, 1954

5-7 Southern Gas Association (Location to be announced)

12-14 AGA Sales Conference on Industrial and Commercial Gas (Location to be announced)

20-23 AGA Distribution, Motor Vehicles and Corrosion Conference, Mount Royal Hotel, Montreal, Canada.

26-28 Mid-West Regional Sales Conference, Edgewater Beach Hotel, Chicago.

May, 1954

9 (week) 35th Annual National Restaurant Convention and Exposition, Navy Pier, Chicago.

10-13 LPGA Annual Convention, Conrad Hilton Hotel, Chicago.

24-26 AGA Production and Chemical Conference, Wm. Penn Hotel, Pittsburgh.

27-28 Natural Gas and Petroleum Association of Canada, Prince Edward Hotel, Windsor, Ontario, Canada.

June, 1954

20-24 Canadian Gas Association, Banff Springs Hotel, Banff, Alberta, Canada.

28-29 Michigan Gas Association, Grand Hotel, Mackinac Island, Mich.

PROFESSIONAL DIRECTORY

G. H. McKAY
CONSULTING ENGINEER • GAS AND PETROLEUM
GAS and OIL INVESTMENT • REPORTS and MANAGEMENT
GAS SALES and PURCHASES
1033 San Jacinto Building, Houston, Texas

COAL AND COKE HANDLING
Complete engineering and installation service for coal and coke handling, screening, crushing, skip hoists and storage bins, including alterations to existing conveying and screening plants.
ROBINS ENGINEERS DIVISION
HEWITT-ROBINS INCORPORATED
157 Chambers Street New York 7, N.Y.

Let Us Install Your **LP GAS PLANT**
Owners of over 80 PEACOCK PLANTS know:
"There's no substitute for experience"
PEACOCK CORPORATION
Box 268, Westfield, N. J. Westfield 2-6258

CONSULTING SERVICE:
On employee and public safety in the gas industry available July 1, 1953.
More than twenty years of experience in the industry with proven results. Past Chairman of the Accident Prevention Committee of the American Gas Association, Past Chairman of the Executive Committee, Public Utilities Section, of the National Safety Council, member of the American Society of Safety Engineers and Veterans of Safety and at present Safety Consultant for A.G.A.
Conference desired with gas company officials to work out a plan to reduce accidents and save cost of operation in your company.
W. H. (Bill) Adams, 35 Upper Croton Avenue, Ossining, New York

RICHARD W. STAFFORD
CONSULTING GAS ENGINEER
2024 Montrose Avenue, Chicago 18, Illinois
Phone SUnnyside 4-0622

"YEARS OF EXPERIENCE IN ONE PACKAGE"
complete LP-gas plants
engineered • designed • installed
H. Emerson Thomas & Associates, Inc.
P. O. BOX 270 WESTFIELD, N. J. WE 2-2800

DRAKETOWN
★ Standby
★ Augmentation
★ 100% Town Supply
PROPANE PLANTS Design · Engineering · Construction
DRAKE & TOWNSEND 11 WEST 42ND STREET NEW YORK 36, N. Y.

CHARLES R. BELLAMY
NATURAL GAS—MANUFACTURED GAS AND MIXED GAS PROBLEMS
44 Prospect Ave. Montclair, N. J.
Phone—Montclair 2-3692

E. Holley Poe Associates
(ROBERT M. POE)
Natural Gas Consultants
Venezuelan Research & Development Corp.
1 WALL ST. NEW YORK 5, N. Y.